THE JOURNAL OF

# MEDICAL EDUCATION

OFFICIAL PUBLICATION OF
THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

NOVEMBER 1959 • VOLUME 34 • NUMBER 11

# THE JOURNAL OF MEDICAL EDUCATION

**Official Publication of the Association of American Medical Colleges**

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*The Journal of Medical Education* is owned by the Association of American Medical Colleges and published monthly by the University of Chicago Press, 5750 Ellis Avenue, Chicago 37, Illinois. Second-class postage paid at Chicago, Illinois.

*Subscription Rates:* $7.00 per year, $13.50 two years, $19.50 three years, $1.00 per single copy; foreign, $8.00 per year, $15.50 two years, $22.50 three years, $1.25 per single copy; Pan America and Canada, $7.50 per year, $14.50 two years, $21.00 three years. Supplements, $2.00.




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*Medical Education Forum* includes editorials, letters, comments, criticisms, and excerpts from important addresses.

*News from the Medical Schools:* Material for this section should be transmitted to the News Editor, Miss Neva Resek, 2530 Ridge Avenue, Evanston, Illinois. Announcements of major faculty and administrative appointments, news of distinguished visitors and significant educational developments will be included. It is not possible to publish notices on grants-in-aid for scientific research.

*Items of Current Interest:* Audio-visual news and notices from national and federal agencies appear in this section.

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# Calendar of Meetings

## ASSOCIATION OF AMERICAN MEDICAL COLLEGES

**71st Annual Meeting, October 31–Nov. 2, 1960**
**Diplomat Hotel, Hollywood, Fla.**

### NOVEMBER

American Academy for Cerebral Palsy, Statler Hilton Hotel, Los Angeles, Nov. 30–Dec. 2. Dr. Glidden L. Brooks, Brown University, Providence 12, R.I., Secretary.

American College of Chest Physicians, Dallas, Texas, Nov. 29–30. Mr. Murray Kornfeld, 112 E. Chestnut St., Chicago 11, Executive Secretary.

American Medical Women's Association, Arlington Hotel, Hot Springs, Ark., Nov. 12–15. Mrs. Lillian T. Majally, 1790 Broadway, New York 19, Executive Secretary.

International College of Surgeons, Mid-Atlantic Meeting of the U.S. Section, Homestead Hotel, Hot Springs, Va., Nov. 16–18. For information, write Dr. E. G. Gill, 711 S. Jefferson St., Roanoke, Va.

International College of Surgeons, Second Western Regional Meeting, Stardust Hotel, Las Vegas, Nev., Nov. 22–24. Dr. F. M. Turnbull, Jr., 1930 Wilshire Blvd., Los Angeles 57, Secretary-Treasurer.

Inter-Society Cytology Council, Statler Hilton Hotel, Detroit, Nov. 19–21. Dr. Paul A. Younge, 1101 Beacon St., Brookline 46, Mass., Secretary-Treasurer.

National Society for Crippled Children and Adults, Palmer House, Chicago, Nov. 29–Dec. 2. Dr. Dean W. Roberts, 2023 W. Ogden Ave., Chicago 12, Executive Director.

Radiological Society of North America, Inc., Palmer House, Chicago, Nov. 15–20. Dr. Donald S. Childs, 713 E. Genesee St., Syracuse 2, N.Y., Secretary-Treasurer.

### DECEMBER

American Academy of Dermatology and Syphilology, Palmer House, Chicago, Dec. 5–10. Dr. Robert R. Kierland, First National Bank Bldg., Rochester, Minn., Secretary-Treasurer.

Association for Research in Nervous and Mental Disease, Inc., Hotel Roosevelt, New York City, Dec. 11–12. Dr. Rollo J. Masselink, 700 W. 168th St., New York 32, Secretary-Treasurer.

First Annual Graduate Medical Education Conference-Residency Training Program, Univ. of Pennsylvania, Philadelphia, Dec. 3–4. Dr. Alfred S. Frobese, Graduate School of Medicine, U. of Pennsylvania, Philadelphia 3, Chairman.

Medical Society of the United States & Mexico, Valley Ho Hotel, Scottsdale, Ariz., Dec. 2–4 (followed by two-day session Desert Inn, Las Vegas, Nev.). Dr. A. H. Tallakson, 2025 N. Central Ave., Phoenix, Ariz., Convention Co-Chairman.

### 1960

### JANUARY

American Academy of Allergy, Hollywood Beach Hotel, Hollywood-by-the-Sea, Fla., Jan. 11–13. Mr. James O. Kelley, 756 N. Milwaukee St., Milwaukee 2, Wis., Executive Secretary.

American Academy of Orthopaedic Surgeons, The Palmer House, Chicago, Jan. 23–28. Mr. John K. Hart, 116 S. Michigan, Chicago 3, Executive Secretary.

American College of Surgeons, Sectional Meeting, the Brown Hotel, Louisville, Ky., Jan. 21–23. For information write: Dr. H. P. Saunders, 40 E. Erie St., Chicago 11.

### FEBRUARY

American Academy of Occupational Medicine, Williamsburg Inn, Williamsburg, Va., Feb. 10–12. Capt. Lloyd B. Shone, Bureau of Medicine and Surgery, Navy Dept., Washington 25, D.C., Secretary.

American College of Allergists, Inc., Americana Hotel, Bal Harbour, Miami Beach, Fla., Feb. 28–Mar. 5. Mr. Eloi Bauers, 2160 Rand Tower, Minneapolis 2, Executive Vice-President.

American College of Radiology, Roosevelt Hotel, New Orleans, Feb. 3–6. Mr. William C. Stronach, 20 N. Wacker Dr., Chicago 6, Executive Director.

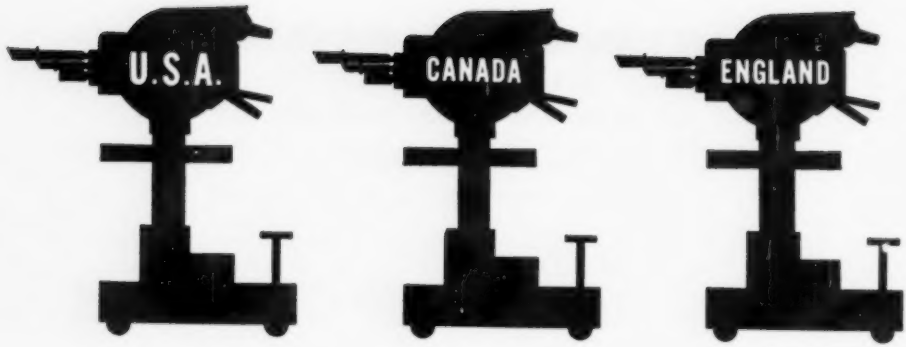
American College of Surgeons, Sectional Meeting for Surgeons and Nurses, Statler Hilton, Boston, Feb. 29–Mar. 3. For information write: Dr. H. P. Saunders, 40 E. Erie St., Chicago 11.

American Orthopsychiatric Association, Inc., Sherman Hotel, Chicago, Feb. 25–27. Marion F. Langer, Ph.D., 1790 Broadway, New York 19, Executive Secretary.

Congress on Medical Education and Licensure, Palmer House, Chicago, Feb. 7–9. For information write: Council on Medical Education and Hospitals, American Medical Association, 535 N. Dearborn St., Chicago 10.

Society of University Surgeons, Minneapolis, Feb. 11–13. Dr. Ben Eiseman, 4200 E. Ninth Ave., Denver 20, Secretary.

Symposium on Fundamental Cancer Research (14th), University of Texas, Houston, Feb. 25–27. For information write: University of Texas M. D. Anderson Hospital & Tumor Institute, Houston 25, Texas.

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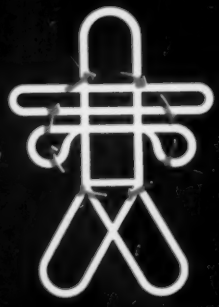


1. Moser, K.M.: J.A.M.A. 767:1695 (Aug. 2) 1958.
2. Clifton, E.E.: J. Am. Geriatrics Soc. 6:118, 1958.
3. Sussman, B.J., and Fitch, T.S.P.: J.A.M.A. 767:1705 (Aug. 2) 1958.
4. Singher, H.O., and Chapple, R.V.: Clin. Med. 6:439 (March) 1959.


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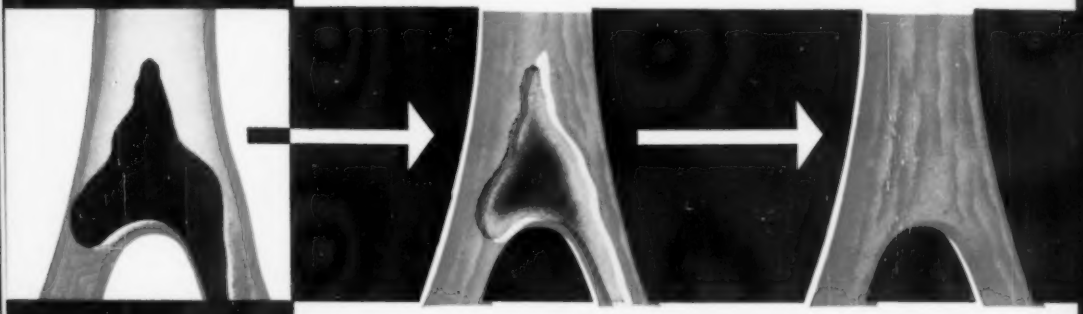

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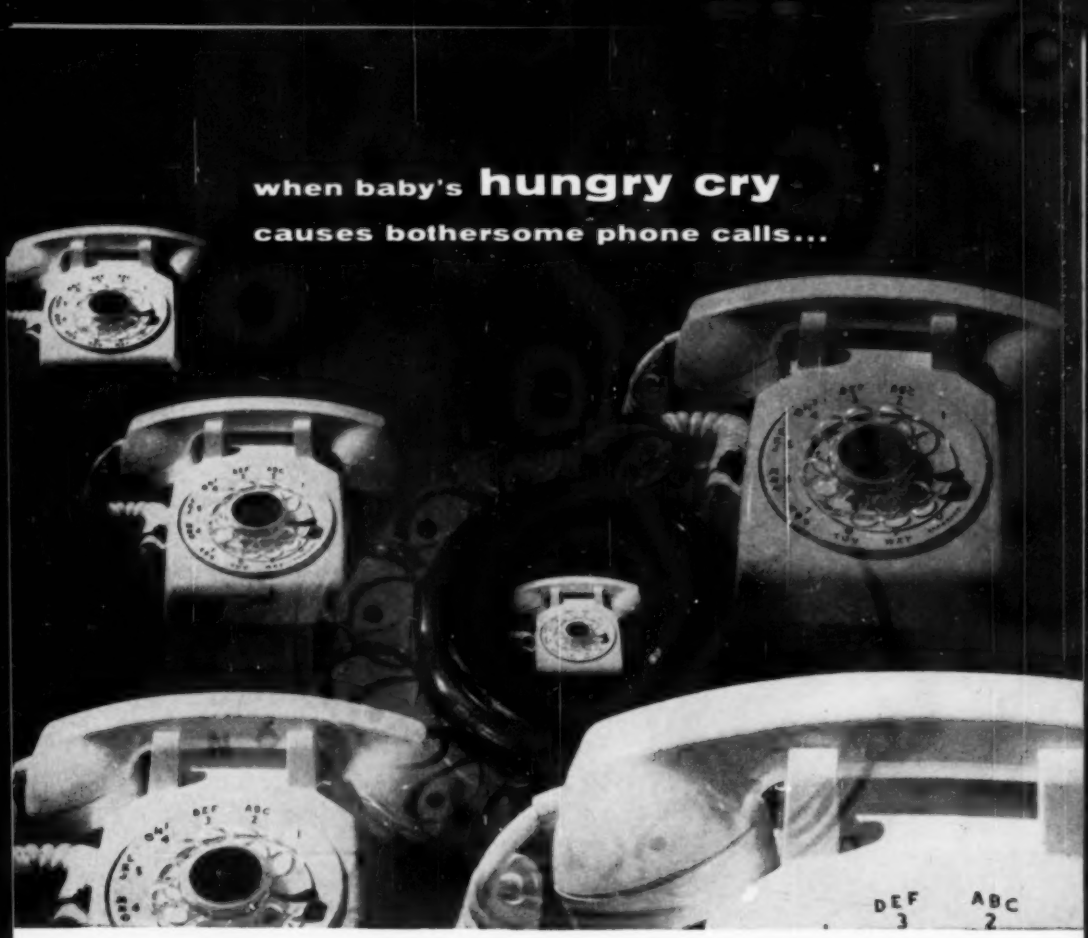


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| 57 | Frost and Jackson[2] | Mean height and weight curves slightly above normal; normal or superior general development. |
| 190 (sick & well infants) | Henrickson[3] | Satisfactory results. Average hospital stay: 5.5 days; average daily weight gain: 3 ounces. |

*Maltose-dextrins formula modifier, Mead Johnson

1. Hatfield, M. A., Simpson, R. A., and Jackson, R. L.: J. Pediat. 44: 32-45 (Jan.) 1954. 2. Frost, L. H., and Jackson, R. L.: J. Pediat. 39: 585-592 (Nov.) 1951. 3. Henrickson, W. E.: GP 8: 51-56 (Oct.) 1953. 4. Litchfield, H. R.: Arch. Pediat. 61: 617 (Dec.) 1944.

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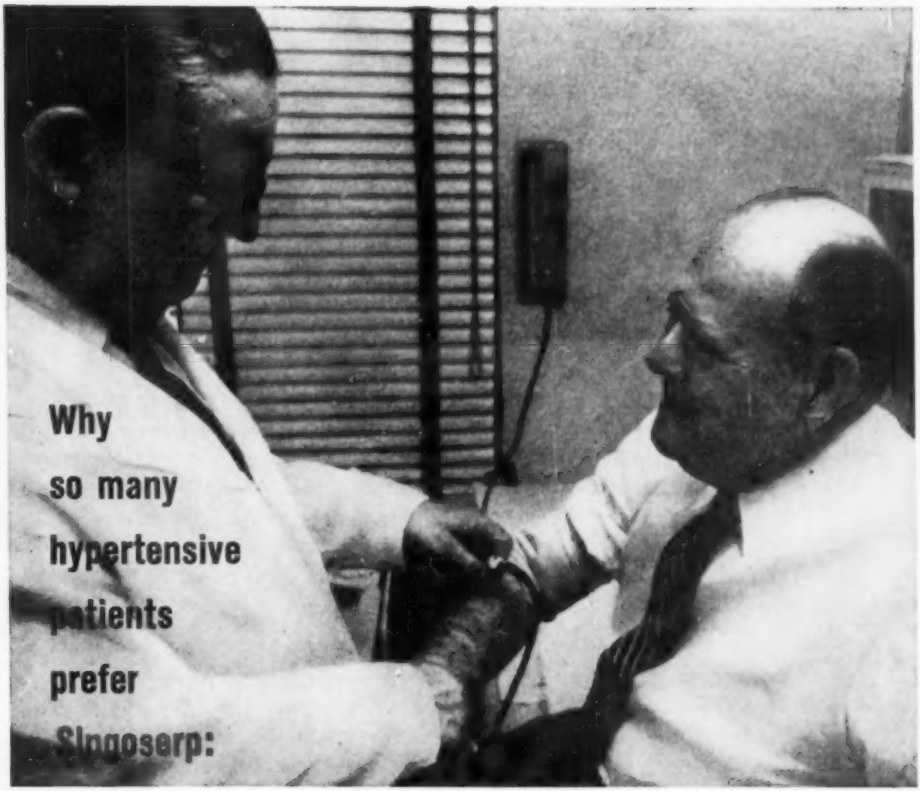


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*Herrmann, G. R., Vogelpohl, E. B., Hejtmancik, M. R., and Wright, J. C.: J.A.M.A. 169:1609 (April 4) 1959.

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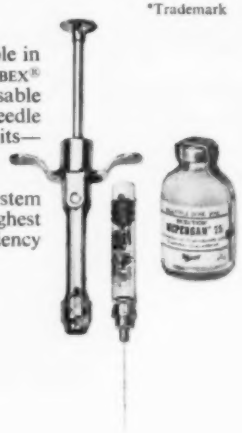

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1. Case reports on file, Wyeth Laboratories. 2. Parks, R.V., and Moessner, G.F.: Dual Approach to Patient Care, Scientific Exhibit, A.A.G.P., April, 1959.

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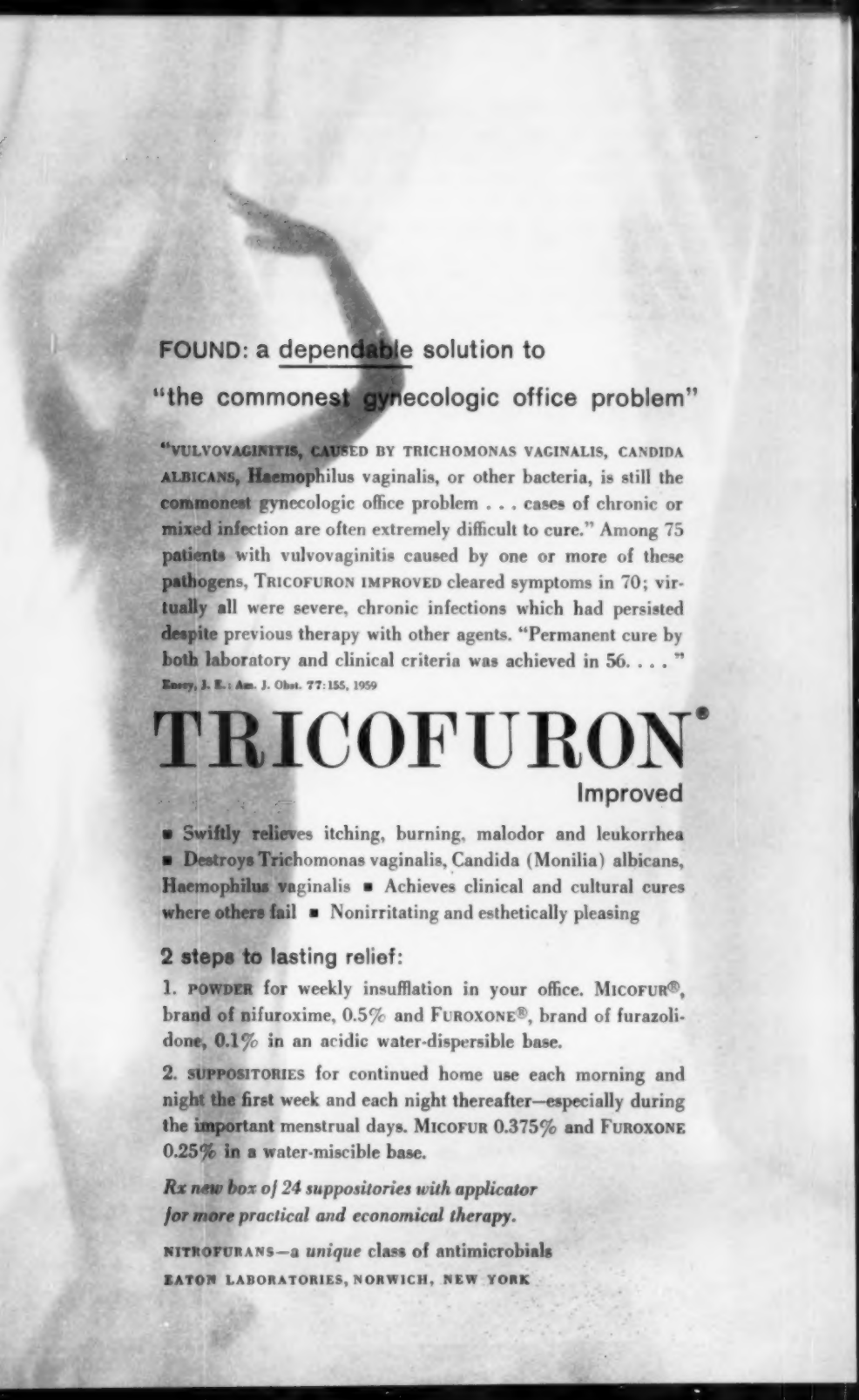

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Emery, J. E.: Am. J. Obst. 77:155, 1959

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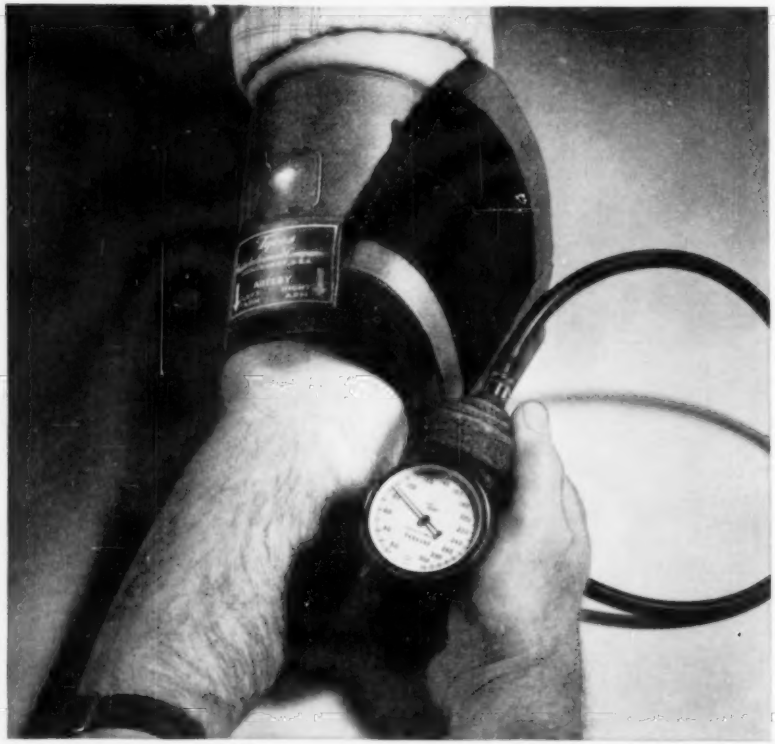

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*The Journal of* MEDICAL EDUCATION

VOLUME 34 • NUMBER 11 • NOVEMBER, 1959

## *Table of Contents*



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# While the patient whirls...

**This represents treatment of a deep-seated neoplasm with a Cobalt-60 Beam Therapy Unit at Montefiore Hospital, New York.**

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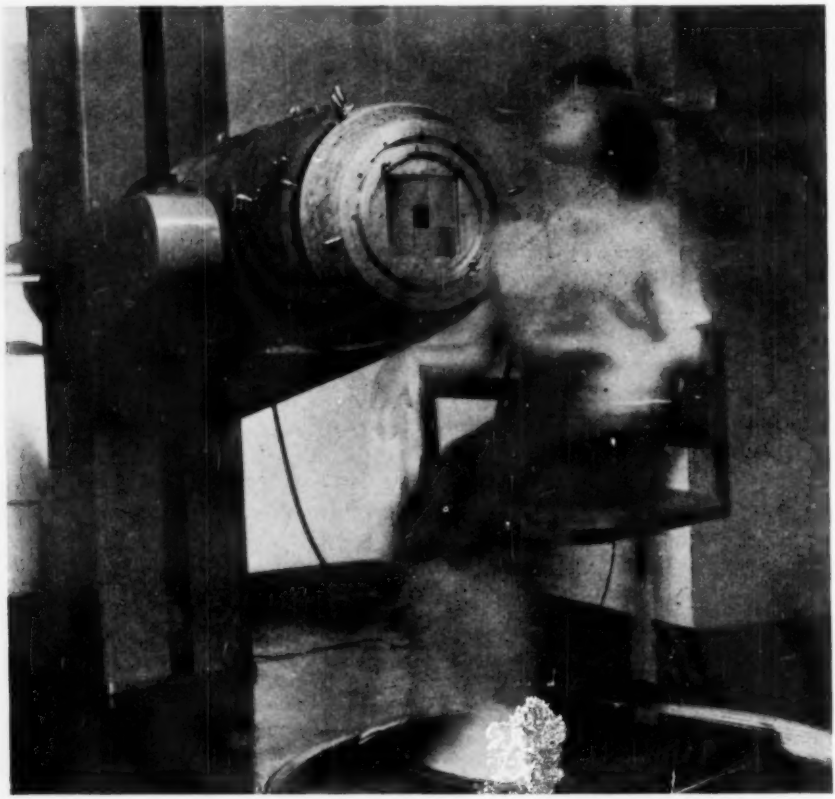

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# The Stanford Plan

## An Educational Continuum for Medicine

LYMAN M. STOWE, M.D.*
Stanford University School of Medicine, Stanford, California

### INTRODUCTION

With the academic year beginning in 1959 the Stanford University School of Medicine inaugurates a new program in medical education. A modification and development of our educational philosophy, it represents to some degree Stanford's participation in educational trends apparent at many schools in the United States and to some degree the attempt to solve purely local problems. It is the result of many months of planning by a widely representative faculty committee.[1]

The Stanford Medical School, through the circumstances of its historical development, has for many years been in the position of apportioning its energies between two physical environments. Students were taught anatomy, biochemistry, microbiology, and physiology on the University campus near Palo Alto, California, some 30 miles south of San Francisco. Work in pharmacology and pathology, together with all clinical work, was carried out in San Francisco. Communication between the two parts of the Medical School, and between the School in San Francisco and the remainder of the University, has been seriously handicapped by the spatial separation. Over several decades the possibility of consolidation of the School on the University campus had been frequently considered and as frequently rejected, since it was feared that the supply of patients, both for teaching and for clinical research, would be inadequate in the area immediately surrounding the University.

The recent increase of population in the West has been strongly reflected in and about Palo Alto, which has thus become an area from which more than adequate clinical material may be drawn. In view of this, the Board of Trustees of the University voted, in July, 1953, to relocate the School of Medicine as a single unit on the Stanford campus. The effect of this far-sighted decision was to open the way for planning of activities which would bring the School of Medicine intimately into the University complex, to the benefit both of the School of Medicine and of other schools and departments of the University. The ideal of medicine in the University setting fostered the development of an educational plan specifically designed to take advantage of a hitherto unavailable opportunity.

Critical faculty appraisal of the curriculum focused on several facets. Most striking, since it was dictated by the fact of physical separation, was the separation in teaching of the basic sciences and teaching of clinical medicine. Interdepartmental or conjoint teaching efforts were lacking in many instances where such teaching could broaden student understanding. The attempt to provide comprehensive coverage of medical knowledge had resulted in domination of the curriculum by required time (some 900 hours had been added over the 15 years ending in 1955); the scanty amount of free time was poorly distributed, resulting in its ineffective use by students. Many faculty mem-

* Associate Dean for Academic Affairs.

[1] The studies on which the Stanford Plan is based were generously supported by a grant from the Commonwealth Fund.

bers felt that too much emphasis was placed on the didactic approach, and that there was insufficient correlation of didactic material with that taught in the laboratory. Finally, and most significantly, consideration of the relationship of premedical education to the study of medicine gave rise to the conviction that too sharp a separation existed between them, to the detriment of the student's intellectual and social development.

### THE STANFORD PLAN

The curriculum is based on three major concepts. The first of these is that all education is a continuum. From this thesis has come our attempt to bridge the separation of medical and premedical work, the fostering of integrated teaching where it is likely to contribute to the learning effort of the student, and the effort to develop learning areas in the medical curriculum which are related to the previous educational experience of the student.

The second belief is that the growth of medical science is so great and continues at so rapid a pace that its comprehensive coverage cannot be achieved, but that at the heart of the study of medicine lies a core of medical knowledge which should be presented to all students, irrespective of their eventual choice of medical career. Each student, as an individual, and in accordance with his particular needs and abilities, should supplement study of the core through independent study of various kinds, and through elective work. Presentation of core material should be by subject areas, rather than by isolated departmental courses, and should be designed to acquaint the student with the concept underlying each of the major branches of medicine.

Complementary to these attitudes is a third: that the student of medicine has passed beyond that stage of his education where the mere acquisition of "facts" can be defended. He is essentially a graduate student and should be encouraged to learn in terms of attitude toward, and approach to, ***problems in medicine***, rather than in terms of the acquisition of techniques or the accumulation of data at the expense of interpretation. He should understand the scientific method, since through its application these problems (clinical or not) are most susceptible of solution.

### OBJECTIVES

The faculty has formulated the following broad objectives for the Stanford Plan:

1. To bring medical education into the University environment as a continuation of general education and to relate knowledge of the medical sciences to other fields of knowledge.
2. To provide all students with fundamental knowledge of the medical sciences, while simultaneously encouraging each student to develop as an individual in line with his abilities and interests.
3. To emphasize the unity of the medical sciences.
4. To promote in students awareness of the place of medicine in society, and of the patient and physician as members of society.
5. To produce practitioners of medicine whose approach to problems in clinical medicine is that of a scientist.
6. To encourage interested students toward academic medicine as a career.
7. To foster a graduate approach to medical education.

To one degree or another some or all of these objectives could apply to the programs of most American medical schools; the unusual quality of the Stanford Plan is the manner in which it has been organized to meet them. The Plan is an addition to the diversity of American medical education, and is not designed to be all things to all men. It provides specific opportunities for students who wish to continue a broad educational development during their medical studies.

The principal features of the program are represented in diagrammatic form in Chart 1. Basically, it consists of a 5-year span of academic work, into which students enter after either 3 or 4 college years. An amount of time (designated "University time"), equivalent to 1 academic year, is distributed

in equal segments through the first 3 years and may be devoted to work in any department of the University. Simultaneously, the student begins the study of the basic medical sciences. An introductory course brings him into contact with clinical problems at the start of his medical work, and in the third year, having developed some understanding of both the basic and the clinical medical sciences, he is introduced to the philosophical and historical aspects of medicine (indicated by "H and P" in the diagram). The fourth and fifth years are devoted to a series of interdepartmental courses whose aim is to acquaint the student with clinical medicine, with the interdependence of the clinical fields, and with the patient as a member of society. Finally, there is available a large amount of free time throughout the curriculum; this rises to a full third of the year's activity in the final year. (The irregular border between "University" and "free" time in years I–III indicates their temporal approximation.)

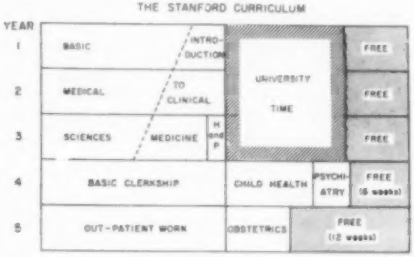


CHART 1.—Diagrammatic representation of the Stanford Curriculum. "H and P" refers to Historical and Philosophical Aspects of Medicine.

## THE "FIVE-YEAR PLAN"

The most striking feature of this program is the provision of a 5-year teaching experience. Early in the discussions of the faculty study committee it was recognized that the breadth of learning and understanding which characterized the outstanding physician of the past was increasingly threatened by the pressure to learn the details of medical science. To combat this it was first proposed that we require 4 years of college preparation of all students before entrance into medical school. Further discussion and study produced the plan of combining broad cultural and scientific studies in the University with the specific program in the basic sciences of medicine. This was the genesis of the 5-year medical curriculum, which was adopted by the faculty as a basis for planning in April, 1956.

Several potential advantages result from this arrangement. Members of admissions committees, and medical faculty members at large, are all well aware of the tendencies of college students to make course choices based as much, or more, on the supposed need to impress admissions committees as on the student's own inclinations. In fulfilling requirements for the A.B. degree, the student who enters the Stanford program after 3 college years will be able to make choices of nonmedical work more in accordance with his own interests, and will be able to choose freely among the natural and social sciences, the humanities, and fine arts. The student who enters already possessed of a baccalaureate degree will be able to pursue a developed interest in his major field of college study, or to follow an interest in some other, differing, field. For all students there will be the opportunity to complement work in medicine with work in related nonmedical subjects (e.g., sociology). The fact that nonmedical time is spread over 3 years, and is supplemented by generous provision of free time within the medical framework, will allow every student to make meaningful use of this time as his own needs may dictate. Finally, spreading the introductory courses in medicine over 3 years should reduce the pressure of learning a large quantity of new material in a short time. The mechanical arrangement of work days during the first 3 years, in particular, allows the student great flexibility in planning a program suitable to his individual goals.

We are aware as well of possible disadvantages. One of these is that, while this program would be open to undergraduates of all universities, potential candidates might re-

ject it on the grounds that if they are to spend 4 years or their equivalent in college work, it would be preferable to spend them all in a continuous span in one college. Second, and possibly even more serious, is that the spread of the final college year over a 3-year span of time, in the case of those applicants who enter Stanford after only 3 college years, might well interfere with the development of the culminating year of nonmedical education, so heavily stressed in the Severinghaus-Carman-Cadbury report, "Preparation for Medical Education in the Liberal Arts College," and re-emphasized in November, 1958, at the Buck Hill Falls Conference on Premedical Education. Third, it would appear that, because of the increased expenditure of both time and money, this program could tend to limit the number of applications from college seniors. Some evidence on these questions has been obtained in our recent experience in selecting applicants for the first year of this program, and will be discussed below.

Expansion, rather than contraction, of the time spent in medical school is in sharp contrast to the practice in other programs recently announced or in the stage of development. After extensive discussion of means through which this program could be contracted in time, the faculty committee charged with its development rejected such contractions, feeling that concentration can best be effective earlier in the total educational span (i.e., in primary or secondary school) of the superior students who come into professional schools. The years of college and professional education represent the time of flowering of the educational efforts of such students; we feel that their opportunity for full development should be unrestricted either by the need for longer academic years or by encroachment upon the educational interests of undergraduate colleges. Here again, it should be emphasized that medical education should provide a variety of choices of procedure and that no single arrangement can be suitable for all applicants.

What opportunities exist in the Stanford Plan for those students who have a baccalaureate degree and those who do not? The students who enter after 3 years of college will be required during the "University time" to take whatever courses may be needed to satisfy the requirements for the baccalaureate degree under the Stanford General Studies Program. Part of this requirement includes satisfying the prerequisites for certification of a major subject in some department of the University. Once the requirements for the baccalaureate degree have been met, the student entering after 3 years of college may avail himself of the opportunities open to his colleague who has entered with a baccalaureate degree. The latter may use the nonmedical time in any way he likes. He may register for formal courses in any of the University departments, and may work toward a Master's degree or toward a Ph.D., provided he is accepted as a candidate for such a degree by a University department, within or without the School of Medicine. He may also elect to devote this entire time to other forms of independent study or to the pursuit of a research program.

### THE CORE AND ELECTIVE PRINCIPLE

The faculty's conviction that it is not possible any longer to give comprehensive coverage of the medical sciences to all students has led to the concept that a core of basic knowledge of these sciences, to which all students should have access, can be developed; this material is contained in the courses diagrammed and named in Chart 1. Consideration of "core teaching" led to the belief that more effective teaching and more meaningful learning would result in some instances from integrated courses, and a number of these were developed, both in the basic sciences area and in the clinical years. To supplement the core, many elective opportunities are provided in both the clinical and preclinical fields. The very large amount of free time is truly free time; a student may utilize it according to his own needs and desires. Some students will spend the time in review of the required material, some will

undertake elective courses in one or several fields, some will devote the time to research, and some may elect to spend the time at other schools or related institutions. Our present third-year class, which will have its last year in Medical School as the fifth year of the new curriculum, has already indicated its choices in this year. Eight students will combine summer and free time in a 6-month experience in varied medical schools in England and in Europe. Approximately an equal number will take work in other American medical schools, both in clinical and in basic science departments. About half the students will use the time in elective medical work at Stanford, and others plan to take courses in the behavioral sciences. There are scattered choices of work in various aspects of public health and preventive medicine.

### INTEGRATION

A word should be said about the degree of integrated teaching in the plan. This concept, as an end in itself, contains as many defects as it does advantages and cannot be applied uncritically without provoking vigorous resistances. It enters fruitfully only where it furthers the attainment of basic educational objectives. With this in mind, we have introduced integrated teaching only when we feel it makes special contributions to effective teaching and learning, and only when those who are to integrate their efforts can agree on a positive approach. Thus in a number of areas the several basic science departments collaborate in the presentation of subject matter of common concern, as do most of the clinical departments. Further, when appropriate, clinical departments contribute to the teaching of the basic sciences, and vice versa. It has also been possible to enlist the interest and help of a number of other departments of the University in the teaching of various areas in all 5 years; among these departments are Sociology, Anthropology, Physics, Philosophy, Psychology, and History.

### THE MEDICAL WORK IN THE PLAN

Chart 2 is a representation of the gross time divisions of the first 3 years. It does not include time allocated to University work. This simplified schema is not a true representation of the program, since some degrees of departmental autonomy in teaching which remain are not evident here, and precise time allocations are not indicated. It illustrates the gradual decrease of time allocated to work in the basic medical sciences coincident with the gradual increase in clinical work, leading naturally into the full scale

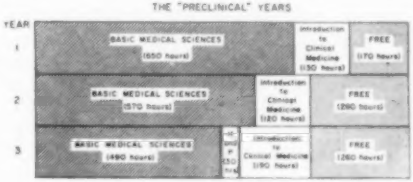


CHART 2.—The medical segment of the first 3 years. Time designations are approximate.

BASIC MEDICAL SCIENCES

| | Subjects | Anatomy: Gross | Anatomy: Micro | Anatomy: Neuro | Biochemistry | Microbiology | Pathology | Pharmacology | Physiology |
|---|---|---|---|---|---|---|---|---|---|
| YEAR I | Cell Structure and function | | X | | X | X | X | X | X |
| | Neuromuscular | X | X | | | | | X | X |
| | Autonomic N.S. | X | X | | | | | X | X |
| YEAR II | Other organ systems | X | X | | | | X | X | X |
| | Infections | | | | | X | X | X | |
| YEAR III | Central N.S. | X | | X | | | | | X |
| | Special Material | | | | | | X | X | |
| | Projects | | | | | | | | |

CHART 3.—The course in Basic Medical Sciences, showing subject sequence and departmental participation.

of the final 2 years. Free time also increases, in keeping with our presumption that the student will be able to utilize more and more of it effectively as he becomes more and more deeply involved in his medical work.

Chart 3 is a diagrammatic representation of the course in Basic Medical Sciences and indicates subject sequence and departmental participation. The course begins with a consideration of cell structure and function, to which all basic science departments contribute to one degree or another. This division of the course is concerned with the

physiologic and metabolic processes within the cell, and their relationships to cell ultrastructure. Following this basic material, the various organ systems are investigated *seriatim;* this in turn is followed by conjoint coverage of the subject of infection. In the final year the central nervous system and special pathologic situations are studied. The course ends with work in independent projects developed by the students themselves, either as individuals or in teams, under the conjoint direction of basic science departments.

TABLE 1

OUTLINE OF MATERIAL COVERED IN "INTRODUCTION TO CLINICAL MEDICINE"

Year 1:
- Development of the Personality (basic Behavioral Sciences)
- Interdepartmental Clinical Conferences
- Medicine and the Physician in Society

Year 2:
- Laboratory Medicine
- Basic Physical Examination

Year 3:
- Interview and Examination
  - Adult
  - Child-parent
- Special Examinations
- Psychodynamics

Much of this course will be carried out in multi-discipline laboratories especially designed for this purpose. Each unit is planned for sixteen students, a number dictated by the hard facts of economics. Within each unit there are high- and low-bench facilities and requisite small pieces of equipment; with the exception of gross anatomy all the work of the basic sciences can be done here. Connecting each pair of student rooms is a central room used for demonstrations, or for experiments with human subjects, and for the accommodation of jointly used major pieces of equipment. In addition, there are centrally located ancillary facilities (warm rooms, cold rooms, isotope counting rooms, and the like) easily accessible to all students. Teaching in these laboratories will be done by departments autonomously where the nature of the material (e.g., basic microbiological techniques) makes such teaching sensible. Many of the laboratory exercises, however, will be undertaken conjointly by two or more departments. Such exercises will take the form of experimental investigations of problems raised in the minds of students as a result of calculatedly provocative demonstrations, rather than the form of standard "cook-book" experiments of ordinary departmental laboratory teaching. In this way the student will be quickly introduced to an understanding of the theory, and practical application, of the scientific method, and will come to know the laboratory as a place of stimulating discovery, rather than as a rutted path along which one dogged, plodding step after another can be counted upon to produce a required result in the fullness of time. This approach to laboratory exercises in the basic sciences will obviously require the student to design and set up his own experiment, to gather the data, and to evaluate them. As a part of his work, he will be taught the use of statistics in the design of experiments and will accumulate data which can serve as raw material on which statistical methods can be demonstrated. Lecture and laboratory work are coordinated within subject areas.

The second major interdepartmental course in the first three years is that in Introduction to Clinical Medicine, represented in Table 1. This course developed as a result of our dissatisfaction with standard introductions to clinical work, which are characterized in the main by a hasty, superficial, and didactic survey of clinical disease, combined by main force with entirely separate courses in physical diagnosis and clinical laboratory methods. Conceptually, it concerns itself with the approach to the patient, rather than with disease itself, and is designed to acquaint the student with the factors, both tangible and intangible, which play their part in the exploration of clinical problems. In its first year, major emphasis is on an understanding of the basic behavioral sciences, primarily the responsibility of the Department of Psychiatry, aided by contributions from other clinical departments

as they become appropriate, and as well from Psychology, Sociology, and Anthropology. In addition to material covered in lecture and seminar, periodic clinical conferences relate physical growth and development to that of the personality. A second series of lectures and conferences begins the exploration of the place of medicine in society and the role of the physician as a social being, which is developed in further clinical work. In the second year, the student will begin his introduction to some of the skills used in dealing with patients, and to learn basic techniques and interpretation of laboratory medicine and physical diagnosis. Necessarily, some consideration of disease will be a natural but secondary part of the study. The third year is planned to strengthen and expand the subjects of the first two. Patient interviews will be combined with physical examination and special aspects of the basic skills developed. These include such things as techniques of examination in the various surgical and medical specialties, interviews with parents, recognition of aberrations of personality, and the like. Throughout the 3 years emphasis is on making the student aware of the patient as a person, rather than as a defective organ system demanding some particular therapeutic approach. The influence of the total environment, including the influence of the physician himself, on the solution of a clinical problem will be stressed.

Although it is of short duration, the course in Historical and Philosophical Aspects of Medicine is worthy of special mention. In Table 2 can be seen the general areas of study and the departmental participation. Except insofar as considerations of medieval and Renaissance medicine lead naturally to the discussion of the rise of the natural sciences and their role in the development of the medical sciences as we now know them, traditional history of medicine does not find a place in this course, but is taught as it plays its part in the understanding of the basic and clinical medical sciences. Rather, the object of this course is to bring to the student an understanding of the place of medicine in the evolution of cultural thought, and the contributions of the philosophical approach to the development of concepts such as that of the disease entity, upon which so much of present-day medicine is based.

Chart 4 indicates the activities of the final 2 years. In the fourth year the Basic Clerk-

TABLE 2

HISTORICAL AND PHILOSOPHICAL ASPECTS OF MEDICINE

| Subject | Department* |
|---|---|
| Ideas of the Nature of Disease | Medicine |
| Medieval and Renaissance Medicine and Their Influence | History |
| The Nature of Science | Philosophy |
| The Role of the Sciences in the Development of the Ideas of Disease | Medicine |
| The Clinical Entity | Medicine |
| Social and Anthropological Aspects of Medicine | Sociology Anthropology |

* University department or school having primary teaching responsibility.

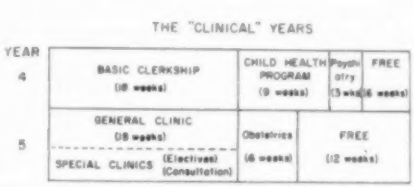


CHART 4.—The final 2 years

ship is primarily the responsibility of the Departments of Internal Medicine and of Surgery, although contributions are made by Preventive Medicine and Public Health, Psychiatry, and the basic sciences. The goal of the clerkship is to provide students with an understanding and thorough knowledge of disease, emphasizing diagnosis and the diagnostic method, and extending to natural history and therapy. As they are admitted, patients are to be assigned to students in rotation, without regard to admitting diagnosis or service. Since it is our conviction that the fundamental difference between internal medicine and surgery lies only in their therapeutic pathways, this method of student assignment emphasizes to the student

the unity of adult medical care. Rounds, seminars, consultative activities, and the like are done in small groups, and the participation of requisite clinical and basic science departments is enlisted. Particular emphasis is laid on the role of environment in such questions as causation and rehabilitation.

The Child Health Program is a combined in-patient, out-patient program, participated in by Pediatrics, Preventive Medicine and Public Health, Child Psychiatry, and Surgery. Its goal is to acquaint the student with the special aspects of medicine pertaining to children. Its subsidiary objectives in pursuit of this goal are to develop in the student an understanding of normal physical growth and social and emotional development, and of their variations in health and disease; to provide the student with an opportunity to deal with children *as children*, irrespective of the presence of disease; to provide the student with the opportunity to observe the parent-child relationship and to learn to work with parents; to acquaint the student with pathological processes, both physical and emotional, as they occur in childhood; to help the student understand the social and emotional problems of children with acute and chronic disease and with physical and mental deficiencies; and to acquaint him with the role of the pediatrician in cooperating with other professional disciplines. The importance of ambulatory care is emphasized, and opportunity to visit the homes of patients where this may contribute to wider understanding of selected problems is afforded. A comprehensive well-child follow-up program is available to the student, affording him opportunity to observe normal children in their relationship with parents. Visits to community facilities such as schools, convalescent homes, social agencies, and the like are also a part of this program.

Special effort has been given to planning the role of psychiatry in this curriculum. As can be seen on the outline, a short block of time has been delineated for in-patient work on the psychiatric wards, but this represents only a small fraction of the participation of psychiatry in the total plan. The remainder of the psychiatric teaching is done in the course in Introduction to Clinical Medicine and in conjunction with other clinical programs, both in-patient and out-patient. Specific provision is made for consulting rounds in the Basic Clerkship, for the presence of a psychiatric consultant in the Child Health Program and in the Out-Patient Department, and for the prolonged follow-up of a limited number of out-patients who have primary or secondary emotional problems. Emphasis is therefore placed on the fact that no illness and no patient (even the ostensibly healthy one) is free of an emotional component.

In the fifth year the student spends half his time in a program of Out-Patient Teaching. This is divided into 18 weeks of half-days in a required general clinic, the remaining half-days being devoted to elective experience in specialty clinics (including general surgery). The student is responsible for the comprehensive care of his patient. For example, he arranges for consultation as necessary, follows his patient through the consulting clinic, and correlates the findings with those of the general clinic and any other consultative agencies within or without the hospital. Return visits are scheduled so that patients may be seen by the same student. Special opportunity is provided for prolonged follow-up of a few patients with chronic disease, and for home visits where these appear likely to contribute significantly to the total understanding of a medical problem. Weekly conferences are held on selected patient problems as a teaching exercise.

The special nature of the clinical material in obstetrics dictates a separate block of time for obstetrical teaching in the clinical years. Some basic obstetrical material, however, is taught in the course in Introduction to Clinical Medicine and in the Basic Medical Sciences, where this fits naturally into the consideration of the reproductive system and its functional aspects. Studies are currently underway whose aim is to provide a prolonged experience in the prenatal clinic.

All patients, whether or not they pay professional fees for service, will be available to medical students for teaching. This will be true for out-patients as well as for those who are hospitalized. Through these means, students will become acquainted with a broad sweep of socio-economic backgrounds among patients, and will thus be afforded a much more realistic view of this side of medical practice than has ordinarily been the case where dependence was placed on patients seen in large city hospitals or in charity clinics. Stanford's position at the center of a rapidly expanding area, as well as the role which it has played for many years as a center of consultation for northern California and for parts of neighboring states, makes this possible.

### THE MEDICAL STUDENT

We have recognized the medical student as a graduate student in allowing him wide freedom in the planning of his own program. As has been mentioned earlier, dependence on didactic teaching is minimized. Instead, seminar methods and the use of small groups, fostered by the physical arrangement in the multi-discipline laboratories and by the provision of many small conference and demonstration rooms, are emphasized. The student is actively encouraged to undertake independent study and research and to widen his horizons, both medical and nonmedical, through the judicious choice of study in other divisions of the University. This does not, however, imply a de-emphasis of the primary importance of the medical sciences.

It is obvious that not all students will be able to plan their own program effectively without help. To assist him in his educational development, each student has a tutor-adviser whose stated function is to foster desirable study habits, independent and critical thinking, lucid expression of thought in speech and in writing, breadth of scholarly enterprise, and the development of an inquiring mind. Necessarily, initial assignment of student to faculty members will have to be done more or less arbitrarily, but the program provides that each year student and faculty member alike may indicate a need for change in the tutorial relationship. The adviser does not have disciplinary functions; his only administrative responsibility is to submit a periodic critical appraisal of the student in terms of total development.

As has been indicated earlier, most students will come into the program after at least 3 years of college. Selection of students for admission is likely to present special problems if we hope to approach optimal matching of student and school. In recognition of this we have begun studies both on the admissions process and on the identification of requisite student characteristics. We are aware that the nature of the Plan will in itself provide some screening of applicants.

In this connection, a brief description of the selection of students to enter the first class under the new program is revealing. In contradistinction to our expectation that the length of the plan would dictate a preponderance of college juniors among the applicant population, 85 per cent of the applicants were in their senior year of college or already had a baccalaureate degree. Among those to whom places in the class were offered, there were acceptances from twice as many senior students as from junior students. Letters from many of these senior acceptees indicated that the educational advantages which they perceived in the Stanford Plan had overborne in their minds the disadvantages of additional expenditure of time and money. Our expectations that the desire to have 4 years at a single college might keep most students at their undergraduate colleges for a fourth year are partially negated by the fact that half of those entering after only 3 years come from colleges other than Stanford. On the other hand, it could be inferred that there is some substance to this expectation from the fact that only 15 per cent of the total applicant group was made up of students in their junior college year. More probably this reflects a well established trend in our applicant group which, in the past 5 years, has

changed our proportion of 3-year students, prior to the initiation of the new plan, from more than 50 per cent to 20 per cent or less.

### THE EDUCATIONAL CONTINUUM

It is clear that something more than the simple provision of mechanical possibility, coupled with earnest desire, is required if the basic concept of the educational continuum is to have meaning. Although this paper is subtitled "An Educational Continuum for Medicine," the program as it has been outlined includes some major, and some minor, discontinuities, and there are places where roughnesses are apparent despite the maintenance of a continuous line. It is, of course, an overstatement to describe the program in its present state of development as a continuum. More accurately stated, it is a first step toward the development of an educational continuum.

Two years ago the undergraduate faculty of Stanford University reported, in a volume entitled *The Undergraduate in the University*, the results of a study of undergraduate education which led to the development of the Stanford General Studies Program. I would like to quote from the introduction to this report:

> Finally, the task of introducing change into and from within a given academic culture, of reaching common consent among several hundred highly individualistic faculty members to new programs and new curricular patterns, is a difficult, complex, and frequently less than orderly affair. Tensions are generated, and conflicts over general educational policy are occasionally indistinguishable from conflicts of personalities and feelings.

Such a statement, with proper change in its quantitative aspects, is almost certainly applicable to a major revision of any curricular pattern. When this is accompanied as well by change in basic educational philosophy, coupled with changes in locale and in the make-up of the faculty group, it must be expected that any new program which results takes on the status of a first rough draft. Continuous and critical re-examination and re-appraisal, both in terms of philosophy and of practice, are a necessity in the coming years. Unless this is done, the plan will surely fail to achieve its objectives. Without continuous study, any curriculum, which properly should be a framework within which faculty and student body may function to the furtherance of their mutual intellectual and educational advantage, becomes instead a rigid cage which suppresses and confines all communication, movement, or development.

### THE FACULTY

It is a truism that no program, however elegantly and carefully designed, can be effective without the understanding and support of those who must function within its framework. At the same time the phrase "understanding and support" should not imply slavish and uncritical acceptance. The Stanford Plan was developed slowly, and with full recognition of the necessity for involving as many members of the faculty in the planning process as possible. The effect of broad participation and of deliberate development was evident in the very wide margin by which the faculty voted to adopt the program. This acceptance indicated no more than willingness to participate in an experiment, as each individual quite properly brings with his participation varying degrees of enthusiasm tempered with skepticism. It is hoped that a planned flexibility in the program will lead to its maximum utilization by the faculty.

The volume *The Undergraduate in the University* contains in its table of contents one item both encouraging and revealing. This is called "Index of Unfinished Business." The temptation is great to append such an index to this paper, but the list would be too long. Such a list does, however, exist. It contains not only items which are of relative immediacy, such as detailed planning of various teaching programs, but as well items such as a program of educational research, whose form and substance are still under study.

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# Behavioral Sciences in the Medical School Curriculum*

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In his survey of a half-century of progress in medicine, Berry (2) endorsed the conclusions of the 1951 Ithaca Conference that a broader concept of human nature and a more scientific understanding of human ecology must be considered basic to the future physician's professional training. In many American medical colleges today curricula are being revised in an attempt to broaden the scientific basis of the students' understanding of patients. It would seem rational and timely now to consider whether scientific contributions from disciplines primarily concerned with human behavior should be included legitimately in the curricula of tomorrow.

Caudill (4) describes "urgent practical reasons for fostering the application of social science in medicine." At the same time he views with dismay the "already overcrowded medical curriculum" and expresses discouragement at the prospect of satisfying this pressing need. "Medicine today is itself in a state of flux: old definitions of disease and health are being called into question; there are many competing concepts of comprehensive medicine, environmental medicine, social medicine, psychosomatic medicine, preventive medicine, etc.; and fields of medicine have become so specialized that it is only with difficulty that they can achieve integration even in a hospital." Viewing this turmoil in medical education, Caudill observes that it is a complex problem to determine where social anthropology might fit "into the maze that now constitutes the field of social science in medicine."

The problem is further complicated by the fact that all sciences dealing with human behavior are in a state of ferment. They could hardly be otherwise, for they are affected by the modern concepts that are revolutionizing the physical and biological sciences. It has become increasingly clear that a scientific understanding of human behavior requires an understanding of transactions among systems. Such transactions begin at the level of the atom and its combinations in physics, chemistry, and biochemistry; they continue among cellular systems, organ systems, organismic systems, and abstract systems relevant to the ecology of man. Grinker's (7) recent emphasis on process and transaction among systems reflects a conceptual trend that is revolutionizing traditional social science in the same way that the concept of relativity revolutionized traditional physics. Clearly, physical and biological sciences are having a tremendous impact upon psychology, anthropology, and sociology.

The necessity to formulate a more scientifically complete picture of the nature of man led a group of faculty members at the University of Chicago to begin a series of interdisciplinary conferences in 1949. They used the term "behavioral science" as a symbol of their joint aims and activities, be-

* Presented at the 68th Annual Meeting of the Association of American Medical Colleges, October 21–23, 1957.

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cause it was acceptable to participating biological and social scientists alike. The behavioral science idea was accepted rapidly. The Center for Advanced Study in the Behavioral Sciences was soon established at Stanford. A new journal, *Behavioral Science*, appeared in 1956. Initially, members of the editorial board of this journal were drawn from psychiatry, psychoanalysis, general psychology, social psychology, neurophysiology, political science, economics, mathematical biology, and education; representatives of anthropology and sociology soon were included.

It is still unclear what the term "behavioral science" means to the people who employ it. Its broadest possible interpretation could include most of the areas of science known to man. The Center for Advanced Study in the Behavioral Sciences was intended to cover all scientific efforts directed toward understanding human behavior. Yet, as Williams (16) has observed, the term may be assuming a significance that excludes essential parts of biology such as genetics, biochemistry, and biophysics. Certainly human physiology is a behavioral science. Other disciplines may now be considered valuable, if not indispensable, when the term is applied to the modern medical curriculum.

In the last 25 years advances in psychology, sociology, and cultural anthropology have had an increased bearing upon basic aspects of human behavior pertinent to scientific medicine. Perhaps it is a good omen that the boundaries of these disciplines (particularly in research) are becoming as shadowy as those between physiology and biochemistry. For example, the Department of Social Relations at Harvard, an amalgamation of sociology, cultural anthropology, social psychology, and clinical psychology, is making increased contributions to medical education, particularly in the School of Public Health.[1]

Behavioral sciences surely are basic to the practice of psychiatry; their inclusion in many psychiatric training programs is long overdue. But *all* physicians work with people, and, as Paul (13) puts it, "To work effectively with people, we must not only be able to see the world as they see it, but must understand the psychological and social functions performed by their practices and beliefs. . . . The threads of health and illness are woven into the socio-cultural fabric and assume full significance only when perceived as part of the total design." Wood (17) has said, "No physician can fully understand his patients unless he is reasonably familiar with all of the possible environmental factors of illness. Indeed, medicine can perhaps best be defined as a study of the interaction of man and his environment. The important environmental variables that influence his well-being include not only physical and chemical forces but social forces as well. Through psychiatry, particularly, modern medicine has become deeply involved in the social sciences, including such disciplines as social anthropology and social psychology."

Unfortunately, psychiatry has occasionally oversold itself or perhaps has been oversold by its friends, especially when it has become identified with certain new programs of "comprehensive medical care." Such programs, when they are developed aggressively in a medical school, appear to threaten the established basic science curriculum like a cuckoo in a warbler's nest, crowding out the rightful occupants. Some of these innovations have been resisted as nonscientific invasions of an already over-burdened medical curriculum. Such resistance has impressive origins. Hippocrates (10), who first tried to liberate medicine from theology and philosophy, objected to excessive involvement of the medical student with nonmedical scholarship: "Some say, indeed physicians as well as philosophers, that it is impossible to understand medicine without knowing what a man is. . . . As for me, I believe that all of these speeches of sophists . . . and all that they have written about nature, belong rather to the business of writing than to medicine itself" (10).

Today in some quarters there is increasing apprehension that the invasion of the

[1] J. P. Spiegel, personal communication.

traditional "basic science time" by clinical activities, plus the growth of new programs teaching the importance of "the total patient," may constitute a regressive movement in medical education. Loeb (9) has expressed grave concern that ". . . There are advocated and adopted in a number of medical schools home care programs for students, even in the first year, with the goal to 'learn about families,' to counsel them and to care for them. . . . There is serious danger that widespread application of these programs might well lead to the conversion of university schools of medicine into trade schools." Loeb connects social sciences with movements for social welfare and views their inclusion in premedical and medical curricula as an attempt to prepare doctors to achieve the "utopian ends" suggested by the World Health Organization's definition of health ("a state of complete physical, mental and social well-being"). Using this concept of the social sciences, he states that their incorporation into the curriculum "would be doubtful in value at present because these disciplines have not yet reached a definitive maturity which can find tangible application to medicine. . . ." Loeb sees serious defects in medicine today that must be corrected, but he maintains that these defects "do not emanate from a lack of background in sociology, or from a dearth of undergraduate home care programs, or of apprenticeships or of emphasis on the details of practice."

Others express concern similar to Loeb's. Atchley (1) notes that ". . . There are strong movements aiming to dilute the medical curriculum with time spent on attempts to inculcate social responsibility by sending students prematurely into patients' homes." Chapman (5) is troubled by recent recommendations for "the introduction of more humanities and social sciences and, possibly, the reduction of basic or natural science requirements in the premedical period. In the clinical years, the conviction seems to be growing that something should be done to make the student less conscious of scientific medicine and more conscious of the social aspects of his profession." He concludes that ". . . the whole basis on which this *Back-to-Nature* movement in medical education rests is unsound, and that the movement itself shares many of the features of frankly anti-scientific movements in general."

Such sincere opinions reflect a widespread feeling which cannot be dismissed lightly. These outstanding educators frankly fear developments that should concern us all: the growth of anti-intellectualism; an over-emphasis on the practical with a corresponding sacrifice of the theoretical; the superficial attractiveness and seductive popularity of programs that may take the student too early into quasi-clinical situations, with resulting neglect of the more sternly disciplined scientific courses requiring a more sustained intellectual effort. We who advocate changes in the medical curriculum must be keenly aware that these changes may provoke negative reactions in our colleagues. Misinformation and misunderstanding may foster an impression that the strong scientific backbone of our modern medical tradition is being riddled with fast-growing popular but unscientific metastases from the humanities, and that the well-grounded physician-scientist of today may be replaced tomorrow by a technologically skillful, drug-dispensing social worker.

It is my thesis that behavioral sciences appropriately introduced into the medical curriculum not only will reinforce the scientific tradition in medical education, but will extend it. It is time that it be extended into areas of medicine that involve manifold aspects of human behavior but that have long been excluded from scientific consideration by the cloak of tradition: "the art of medicine."

The burden of proof falls upon those of us who maintain that there exist truly scientific ways to understand human behavior. Carnap (3) once declared, "It is obvious that, at the present time, laws of psychology and social science cannot be derived from biology and physics. . . . On the other hand, no scientific reason is known for the assumption that such a derivation should be in prin-

ciple and forever impossible." As a matter of fact such derivations are being made today, and even where they have not been made, good scientific research rapidly is pushing forward our knowledge. Such progress is long overdue. I concur with Russell and Russell (15): "The understanding and control of human behavior is beyond doubt, in practical terms, the most urgent problem of contemporary science."

The behavioral sciences are still developing. "Sciences are not cast in a mold, but are formed and perfected by degrees, by often handling and polishing, as bears lick their cubs into form" (12). Our patience must apply to behavioral as well as other sciences. From basic medical sciences such as pharmacology and pathology vast quantities of respectable data have emerged that still cannot be directly related to the physical and biological laws that surely underlie them. Actually, scientific psychology already offers a wider variety of working hypotheses and laws, observable in nature and suitable for experimental testing in the laboratory, than does anatomy, whose value in the medical curriculum nobody would dispute.

Physical sciences should not be evaluated by the errors of scientists nor by the misapplication of scientific techniques; no more so should behavioral sciences. In fact, behavioral sciences offer a medium through which such errors and misapplications may be understood. To illustrate this, let us apply the techniques of behavioral science to the problem of evaluating some of the new "home care" and "comprehensive medicine" programs. Consider an analysis that might be made by a sophisticated social psychologist. How valid are reports of the program's great value and success? Are they in part a function of our culture's tendency to think that something new is necessarily an improvement? Are the chief ingredients of a new clinical teaching program's apparent success nothing more than the enthusiasm and energy of its innovators? Consider the individuals involved in such an enterprise: foundations that provide financial support; planners who accept such support in the sincere expectation that the new program will work wonders; students who are convinced subtly or obviously of their good fortune to be involved in it; and patients who benefit from the optimistic spirit of the enterprise. Do all these form an unconscious conspiracy to prove the program's worth, perpetuate its existence, and propagate its ideas as widely as possible? May not earnest spokesmen for the program publicize it at home and abroad long after objective observers can see that the new program, its novelty gone, has no significant advantages over the old?

I do not wish to imply that all new programs in medical education fit into such a pattern; many of them undoubtedly represent genuine progress. A medical school faculty must be equipped to evaluate and judge such programs, however, and its task will be easier if the faculty members themselves are sophisticated in behavioral science. Such a faculty might not hastily adopt superficially attractive innovations such as those criticized by Loeb, Atchley, and Chapman.

When behavioral science is considered *as science* and dissociated from the programs that have been viewed with such apprehension, our critical colleagues are the first to indicate an attitude of acceptance. For example, Atchley, elsewhere in the article previously quoted (1), states that ". . . it is imperative that (the ideal physician) be a scientist, and therefore the primary responsibility of a medical school is the development of scientific understanding." In Atchley's view even social problems, with which the physician properly may be concerned, call for "exceptional objectivity and austere critique, which are learned best within the university walls." Similarly, Chapman (5) declares, "One can never get very far from the fact that medicine is directly concerned with human beings and represents a sort of final common path down which scientific principles must travel in order finally to be applied to man himself."

If we may assume, then, that a background in behavioral science is desirable for the modern physician, our next problem is to

decide when to introduce this material, how extensive it should be, and who should be responsible for teaching it. If it is to be part of the premedical education, i.e., if courses in psychology, sociology, and anthropology are required for admission to medical school, what assurance is there that the courses will contain the most pertinent material? A survey by Pilot and Lidz (14) reveals considerable variability, geographic and otherwise, in premedical course-content.

If behavioral science is to be included in the medical school curriculum, will material from these disciplines be introduced by various departments in the basic years? Will departments of behavioral science be created to meet the need? Or will one department, already existing in the school of medicine, take upon itself the responsibility to insure an appropriate presentation of this material?

In seeking the answers to these questions, one automatically turns to the experiences of medical schools whose recent curricular experiments have created widespread interest. Unfortunately, many of these experiments have not yet fully clarified the issues with which we are concerned here, perhaps because they were not structured to do so. Many of the newer programs, concerned largely with clinical material and clinical situations, do not meet or propose to meet the criteria of a satisfactory training in behavioral sciences. Such programs do not necessarily incorporate contributions by sociologists, anthropologists, social or experimental psychologists. Much more commonly the participants are social workers (whose training in scientific sociology may be negligible), and clinical psychologists (some of whom may be more interested in psychotherapy than in the science of human behavior), as is suggested by Matarazzo's recent survey (11).

Furthermore, despite some recent insistence that the medical student should work with patients or families during the basic science years, it is apparent that establishment of such a program does not necessarily provide a satisfactory background in behavioral sciences. The increasing inroads made by clinical departments into the first 2 years of medical school, without a sufficient corresponding shift of basic science teaching into the clinical years, already have caused unfavorable reactions. Premature involvement with patients and clinical details may preoccupy the student with technical and practical aspects of patient management, to the detriment of his acquisition of basic scientific knowledge which should underlie the practice of medicine. It is too simple to excuse this tendency by the argument that there is so much to learn nowadays that no student can absorb it all anyway, and that we should try mainly to arouse in him a proper humanitarianism, hoping that he will pick up whatever science is required to take reasonably good care of his patients. Such arguments do indeed reflect an anachronistic tendency toward a "trade school" approach to medicine.

I do not mean that we should discourage the student from developing humanistic attitudes and a sensitive awareness of psychological factors in health and disease. The issue is partly a matter of content and partly a matter of timing. A strong grounding in the scientific bases for the practice of medicine should precede assuming clinical responsibilities.

Clinical demonstrations are of proved value in arousing and maintaining a student's interest in his basic science studies and in illustrating the facts of pathology, microbiology, anatomy, physiology, or even psychology. It is a different thing to start the student off as an apprentice clinician before he has the background to benefit from the time spent. Here is the crux of the entire issue: in view of the complexity and quantity of scientific information pertinent to medicine, a course or activity must be judged not only on its intrinsic value but also on whether it is the *most* valuable way the student can spend his time at any given level of development.

Psychiatry has played a vigorous role (perhaps too vigorous sometimes) in introducing clinical activities into the first 2

years of medical education. Unfortunately, psychiatry as a specialty may be too far removed from its own roots in basic science, but responsible leaders in psychiatric education are making efforts to remedy the situation. I agree with Lidz (8) that a department of psychiatry is both a preclinical and clinical department, but psychiatry should not use this status to introduce lengthy courses involving extensive patient contact, to the exclusion of more rigorously scientific and basic studies. It may intrigue freshman and sophomore medical students to dabble into the problems of patients, and psychiatry may win some popularity with the students in this way; but is time spent in such activities as effective in leading the student to a greater scientific understanding of man as would be the same time spent in acquisition of basic knowledge, including the terminology and techniques of behavioral sciences?

At the University of Oklahoma Medical Center an unusually broad approach to clinical instruction in medicine has been developed. Colmore and Wolf (6) have described the longitudinal curriculum in the senior year. This curriculum has provided an excellent proving ground where the student's understanding of basic sciences and his ability to apply his knowledge can be observed and developed. The over-all curriculum, providing for 2 years largely devoted to basic sciences, followed by 2 years devoted mainly to clinical clerkships, has remained fairly stable. In this setting, when the Department of Psychiatry was reorganized in 1955, careful consideration was given to the optimal utilization of Psychiatry's 32 hours in the first year.

The final plan was influenced by the following concepts and considerations: (*a*) progress in the behavioral sciences has become so extensive, and so pertinent to medicine, that a modern physician should have at least a basic exposure; (*b*) premedical requirements are so variable, and the course material so unpredictable, that some formal presentation of data from the behavioral sciences must be provided in the medical curriculum; (*c*) the behavioral science material essential to good medical practice should be incorporated into the first two ("preclinical") years of the curriculum; (*d*) the medical school should provide formal faculty status and departmental membership for appropriate behavioral scientists.

With these points in mind, the Department of Psychiatry and Neurology petitioned for its own reorganization. This was approved by the faculty, the Dean, the President of the University, and the Board of Regents. On February 14, 1956, a new Department of Psychiatry, Neurology, and Behavioral Sciences was formally designated. Since that time there has been a steady growth of the influence of behavioral sciences in the medical curriculum at Oklahoma, and a widespread acceptance of this throughout the School of Medicine.

Our course material in behavioral sciences draws upon the following: (*a*) philosophy of science, (*b*) general psychology, (*c*) physiological psychology, (*d*) experimental psychology, (*e*) social psychology, (*f*) sociology, (*g*) cultural anthropology, (*h*) ethology, (*i*) human ecology, (*j*) growth and development of the human being in our society. From each of these areas is selected material particularly appropriate for the scientific development of a physician.

Such a course should emphasize factual data as observed in nature and as organized into hypotheses testable in the laboratory. Ultimately, a laboratory component of the course (in collaboration with physiology) should be considered. Human subjects can be employed to demonstrate and illustrate facts and concepts, without the student's necessarily assuming a clinical role.

The ideal medical curriculum remains unknown. There is a greater degree of experimentation now in medical education than ever before, and various approaches must be explored if an improved basic curriculum is to evolve. At the same time, we must not lose what is most valuable in our present professional training of physicians: the hard core of basic science and the intellectual discipline of the scientific approach.

Entirely consistent with this orientation

is the thesis that behavioral sciences must be considered basic to the education of the physician of tomorrow if he is properly to meet his responsibilities to his profession, to his patients, and to himself.

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# Five Schools Linked Together for TV Teaching

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Philadelphia's five medical schools recently joined together in a closed-circuit color television network to present a series of lectures on forensic pathology to their students. Dr. Joseph W. Spelman, Medical Examiner for the City of Philadelphia, lectured to some 1000 students comprising the junior and senior classes at these schools. There was no dislocation or disruption in any of the institutions. The students remained in their own familiar lecture halls and took this instruction as they might any other. Special techniques and cameras gave the students—on 4 × 6-foot screens—a close-up view of material which might have been difficult to see in ordinary lecture-demonstrations.

This unique experiment in medical education was carried out with the full cooperation of the deans of the five schools: Woman's Medical College of Pennsylvania, University of Pennsylvania School of Medicine, Jefferson Medical College, Temple University School of Medicine, and Hahnemann Medical College. They were assisted by the Medical Education Service Unit of Smith, Kline & French Laboratories which produced and sponsored the program.

The committee of deans agreed that forensic pathology was a topic that might lend itself to such a presentation. Dr. Spelman, the Medical Examiner, lectures from time to time at several of the medical schools in Philadelphia, but he is usually unable to fulfill all the requests for teaching. He heads a staff of 60 persons at the Medical Examiner's office, and the demands of his post leave little freedom for lecturing. However, the very nature of his work, particularly in this crowded and changing metropolis, puts into his hands material with a unique value for teaching forensic pathology. The deans felt that closed-circuit television would make it possible for him to conserve his time and energy. With one series of lectures he would be able to reach all five schools simultaneously. (See Appendix for précis of lectures.)

The lectures originated in a "laboratory-studio" at the Smith, Kline & French Building. Each was an hour long. They were presented at 5:30 P.M. on March 31, April 2, 6, 8, and 10, 1959. It was difficult to arrange a time suitable for all the schools. Attendance was voluntary in most instances. Even though the late scheduling cut into the dinner hour of most of the students, the attendance was about 80 per cent. No regular class time was sacrificed to make the series possible.

The experienced staff of the SK & F Color Television Unit set up the electronic network that tied the schools together. A TV camera was trained on Dr. Spelman in the lab-studio, and its signal sent by coaxial cable to a large dish-shaped antenna on the roof of the building. From here the signal was beamed to a similar antenna on the roof of the telephone building about a mile away. There it was amplified and simultaneously rebeamed to antennas on roofs of four schools; the fifth had a coaxial cable previously installed. From these antennas it descended via coaxial cable to the projectors in the auditoriums. The image, projected on screens 4 × 6 feet, could be viewed comfortably by the several hundred students in each of the auditoriums.

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The sound for the program was carried by special telephone lines and amplified at the auditoriums for broadcast simultaneously with the picture. In addition, a "party-line" phone hookup provided a direct line for student questions through a moderator at each school. Dr. Spelman answered these questions directly from the screen. After the series, it was felt that moderators' voices should have been audible over the air to add impact.

A closed-circuit system with this two-way sound connection preserves some of the intimacy and the privacy of the classroom situation. In spite of the mechanical and electronic gear, there is a feeling of psychological comfort in the knowledge that this is primarily a conversation and exchange of ideas between teacher and student, with no intruders. The effect is further enhanced by the remarkable realism of first-rate color television.

To show fine detail in sections, a new completely transistorized color camera was mounted on a microscope. This camera is still in the experimental stages of development at RCA.

With this camera mounted on a microscope, Dr. Spelman was able to show meticulous detail in sections he had brought to the studio. In one slide he demonstrated the serrated and irregular margin of the alveoli septa, a characteristic of the aerated lung. This was contrasted with another slide of a stillborn baby in which the alveoli did not have the serrated edge. The blown-up images of the slides were almost as clear as a direct viewing.

In addition to microscope slides, the lecturer used gross specimens, projected color transparencies, implements causing death, charts, graphs, reagents, testing apparatus, and other devices to supplement his presentation. Ordinarily, the assembling and transporting of such material are onerous chores. The teacher of an individual class often foregoes their use and settles for the easier textbook approach, or a straight lecture. But television, with its improved teacher-student ratio, encourages the use of demonstration materials.

The visual approach dominated. There was very little use of the camera directly on Dr. Spelman. He documented the case studies with pictures, slides, tests, etc. Almost everything he said verbally was illustrated visually. The teaching impact was doubled.

To get the optimum clarity at the receiving end the room must be darkened. This presents problems to students who want to take notes and to lecturers who may want to test students. It might be wise, therefore, in future projects of this sort to prepare a mimeographed or printed digest of the lectures.

The Philadelphia experiment was fortunate in that it included the assistance of a skilled SK & F team that has had a decade of experience with medical television. This know-how translates itself into a smooth performance. The viewer felt that Dr. Spelman was at ease. Slight mishaps in demonstrations were taken in stride. This ease was no accident. It was the result of a judicious choice of lectures coupled with the subtle skill of an expert production team.

The reaction of students, teachers, and deans was favorable and in some cases quite enthusiastic. Dr. Marion Fay, Dean of Woman's Medical College, in commenting on the use of television for other selected areas of the curriculum, said: "The possibilities are unlimited and it would be a most worthwhile program to continue. The reaction here was one of great enthusiasm for the technique and both students and faculty are hopeful that this is the beginning of a lasting type of program. There are a number of fields in which this type of program would be useful and helpful . . . such as medical genetics or anthropology, for example."

Dr. William B. Kennedy, Associate Dean of the University of Pennsylvania Medical School, said: "My reaction to this medium of education on the basis of this single experience is a controlled favorable one. By this I mean that I doubt that we shall wish to use this medium for an extensive and broad series of lectures and exercises covering the more common entities that are fa-

miliar to large numbers of persons on the faculties of all schools. These subjects are best handled by a more individual type of instruction that would suffer rather than be enhanced by television communication to other areas. On the other hand, there are limited areas, and forensic medicine is certainly one of these, where the supply of able and experienced teachers is quite limited."

"A television hookup, such as the one used, is a way of spreading the effectiveness of these good men in a way which conserves their time and energy."

Dr. Warner F. Sheldon, Chairman of the University of Pennsylvania Medical School's Curriculum Committee, in a communication to Dr. Spelman, said that his committee would be getting student reaction on courses they had taken during the year. The material is drawn from questionnaires prepared and answered by students of each class. In anticipating the student comments on the television series, Dr. Sheldon said: "I think that student opinion will be favorable, but I know that this will not be unanimous. A few stray comments I heard indicated that some students were repelled by the sensational character of the material. To me, the violence of their reaction indicates the need and real educational value of this sort of presentation. The public expects doctors to know about these things and the tabloids are a poor source of reliable information. I can say that I never saw a quieter, more attentive audience: this at an hour that cut sharply into their supper schedules.

"In my personal opinion, both the technique of television presentation and the content of the program was a definite success and I hope it will be repeated in due time."

Students at Hahnemann Medical College commented on the sense of immediacy that Dr. Spelman brought to the lecture platform—a feeling of physical nearness to his subject matter as well as his audience. The teaching was not a bookish monologue. One felt that he had just left the autopsy table at the city morgue to take time out to discuss what he had seen and done. It all added up to dramatic impact in the best educational sense.

## DISCUSSION

The success, even in a limited way, of this experiment points up its potential as one answer to the critical shortage of good teachers in all levels of education. Perceptive observers have pointed out that we don't make the most of our best talent. The idea of the "master teacher" is beginning to take root. From kindergarten to professional school a move is being made to exploit more fully the rare and gifted teacher. This is the man for the largest student audience. Television offers the best means of disseminating his influence.

The time may be coming when a top-ranking man in one school may be shared occasionally, via TV, with others. All of us in medical education know a score of fine teachers we'd like our students to see in action. The sharing of scientists and scholars among our great universities is not a new idea. It goes on all the time. But with closed-circuit television we can do it quickly and easily with the least amount of administrative disturbance.

Although medicine has been quick to invent and use the apparatus of research and therapy, the teaching arm of the profession has been slower and more reluctant to modify the traditional methods of instruction. Teaching is essentially the art of communication; and communication has come a far way from the Socratic dialogue.

The distinguished group of scientists who make up the President's Science Advisory Committee suggested recently that schools "develop and supply adequate teaching and learning aids of all appropriate kinds, including motion pictures, television, tape recordings, slides and other audio-visual materials designed to aid the student in understanding the subject more thoroughly, and especially to relieve the teacher of unnecessary burdens of preparations and instruction, and to enable the outstanding teacher to reach a much larger number of students."

Properly thought of, color television is not a teaching technique, but a teaching medium. It is a method of communication offering a combination of advantages for medical instruction. Television does not radically alter the teacher's basic methods; however, it does make his techniques more versatile in their manner of presentation, clearer in terms of what can be seen, and more accessible to large numbers of students.

Close observation is one of the techniques that has always been regarded as indispensable for the teaching of medicine. However, before the advent of medical color television, many educators felt they had come to an impasse as far as this time-honored method of teaching was concerned. For example, surgery today requires an operating team that virtually surrounds the operating table. Consequently, most of the intricacies of an operative procedure are lost to students seated in an amphitheatre, even one of modern design. Filmed operations could be substituted for "live" operations, but only at the cost of the suspense and realism inherent in watching an operation actually in progress.

The situation is much the same in teaching clinics. Classroom lecturers have been faced with a three-cornered predicament. They must employ the most pertinent clinical material available; they must demonstrate this material with the greatest possible visual clarity; and they must reach a large student audience without losing effectiveness.

Color television provides at least a partial answer to this urgent problem of visual participation. With specially designed cameras, a vantage point of only a few feet above the operating table can be gained for the viewer. For operations within extremely restricted areas, magnifying lenses are employed to bring the viewer still closer to the surgical field. When the camera is focused on such a field the audience has a view equal to that of the surgeon and better than that available to most of the members of the operating team.

The camera eye can go virtually anywhere. With new progress in miniaturization, portability increases. The new cameras fit on the oculars of microscopes. They can be affixed to a surgeon's helmet. In the process of development at the moment is one small enough to be used in endoscopy. With each advance in electronic engineering there is a corresponding new opportunity in teaching. There is a need for educational research to test these useful new products of technology. Television is no miracle to revolutionize teaching. It is, however, a useful way to extend the aura of a good teacher's influence.


## SUMMARY

An experiment in medical education, for the first time linking five major medical schools by closed-circuit color television, took place in Philadelphia. Some 1000 students in the junior and senior classes watched the telecasts on screens $4 \times 6$ feet in their own schools. The lecturer for this series was Dr. Joseph W. Spelman, Medical Examiner for the City of Philadelphia. His topic, forensic medicine, covered five 1-hour lectures. The series included: The Scope of Legal Medicine; Fetal, Neonatal and Infant Death; Medicolegal Aspects of Obstetrics and Gynecology; Suicide; Homicide.

Reaction was good at the participating schools. Generally, it was felt that this is a potentially useful technique, especially for highly specialized topics in which the availability of experts is limited.


## APPENDIX

### Lecture I

*March 31: The Scope of Legal Medicine; Unexpected Death.*—Legal medicine is the broad and ill defined field where law and medicine interrelate and interact. The first part of this lecture considered a few areas of inter-relations and emphasized the role of the medical examiner in the legal and medical communities. In the second part, cases of unexpected death from natural causes with emphasis on the role injury may play in the aggravation of disease were presented.

Lecture II

*April 2: Fetal, Neonatal and Infant Death.*—Some 300 infants are found dead in their cribs or discarded in the city's sewers or dumps each year. Many have died of unexpected natural causes, but abortion, accident, and homicide are not infrequent. Specimens and photographs of actual cases were used to illustrate little known, but important aspects of the subject.

Lecture III

*April 6: Medicolegal Aspects of Obstetrics and Gynecology.*—Rape and abortion present unusual problems to the practicing physician. Although such cases are sensational, they present multiple difficulties to the doctor-patient relationship. Such problems are increased when there is evidence of sex perversion. Doctor Spelman discussed several cases of this sort.

Lecture IV

*April 8: Suicide.*—The actual number of suicides per year in the United States is approximately equal to the annual number of vehicular deaths. This startling statistical fact clearly illustrates the necessity for the practicing M.D. to have an awareness of the problems common to self-inflicted death. Doctor Spelman illustrated this subject with the aid of photographs, actual suicide notes, and showed weapons of self-destruction. Also, he discussed some of the psychiatric and medicolegal problems encountered.

Lecture V

*April 10: Homicide.*—There are as many recorded deaths from murder as from cancer of the uterus. A physician is frequently the first person called to the scene of death. Dr. Spelman explained what the practicing physician should know in order to preserve the scientific evidence at the scene and to protect his patient's interests.

# Medical Education in Sydney

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The University of Sydney has been struggling with the problem of how to deal with its large number of students. As a visitor I was able to see something of this a few months ago. The present overcrowding is stated to be due to a number of causes, and, owing to the unrestricted entry of students, a situation has been created which is probably unparalleled in the British Commonwealth. A decision of the High Court of Australia (by a suit brought by a medical student against the University) held that, in terms of its Charter, the University has no power to refuse admission to matriculation. As the matter now stands it is for the University to decide whether it would be prepared to take its stand on the subtle distinction between the right to matriculate and the right to be admitted to a particular faculty. It might also be questioned whether the University has the right to accept all medical students in the State who have passed the matriculation examination when it is unable to provide adequate staff and accommodation to do so. Considerable limitation in admissions to universities in the U.K. has been necessary: in 1953 there was an over-all count of 70,000 applications for only 19,000 places; the actual number of applicants is not known but, on the general basis of each applicant making application to two universities, it may have been about 30,000.

TABLE 1

| | Total enrolments in the University | Total enrolments in the Faculty of Medicine |
|---|---|---|
| 1958 | 9,600 | 2,016 |
| 1959 | 10,200 | 2,142 |
| 1960 | 10,800 | 2,268 |
| 1961 | 11,600 | 2,436 |
| 1962 | 12,200 | 2,562 |
| 1963 | 12,800 | 2,688 |
| 1964 | 13,400 | 2,814 |
| 1965 | 13,900 | 2,919 |
| 1966 | 14,200 | 2,982 |

TABLE 2(a)

| Total | New students | Total enrolments |
|---|---|---|
| 1951 | 232 | 320 |
| 1952 | 294 | 389 |
| 1953 | 261 | 361 |
| 1954 | 267 | 327 |
| 1955 | 302 | 410 |
| 1956 | 358 | 469 |
| 1957 | 370 | 497 |

TABLE 2(b)

PREDICTED TOTAL ENROLMENTS IN THE FIRST YEAR

| | |
|---|---|
| 1958 | 532 |
| 1959 | 568 |
| 1960 | 598 |
| 1961 | 643 |
| 1962 | 676 |
| 1963 | 709 |
| 1964 | 742 |
| 1965 | 770 |
| 1966 | 787 |

Calculated from mean ratio between enrolments in first year and total enrolments in Sydney University between 1954 and 1957 and the predicted enrolment in between 1958 to 1966.

Predicted enrolments in Sydney University are shown in Tables 1 and 2(a) and (b).

Table 2(a) indicates the trend in the numbers of new students and total enrolments in the first year of the medical curriculum between 1951 and 1957.

There are about 12 per cent of Asians in the Faculty of Medicine.

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Table 3 shows the student numbers in departments in the Faculty of Medicine in 1958 and the predicted numbers for 1966.

The fate of the enrolled medical students is shown in Table 4. Overcrowding in the Faculty of Medicine in the University of Sydney is in large measure due to the number of students repeating each year. The high wastage rate of 45 per cent and graduation deficit of 50 per cent implies disappointed hopes and fruitless effort.

From this it might be deduced that a process of self-selection takes place and that the ultimate graduates are the best of the original enrolled. The major elimination occurs in the 1st, 2d and 3d years of the 6-year course. Arguments have been made to limit the intake. If, by initial selection the intake to the Faculty could be reduced to 200, the situation may be more manageable. In the British Commonwealth no Medical School considers a figure of even 150 compatible with efficiency, teaching, and research. By contrast, the Faculty of Medicine in Sydney accepts 400 new students each year, and overcrowding in some of the departments is worsened by a large number of nonmedical students receiving some instruction in these departments. No wonder difficulties arise in regard to staff, students, and facilities. The much needed tutorial system is nearly impossible. In this environment it is difficult to "inspire both a desire for learning and the will to extend the boundaries of knowledge." Some of the lecture theatres have to contain over 500 students in the preclinical

TABLE 3

STUDENT NUMBERS IN DEPARTMENTS IN THE FACULTY OF MEDICINE*

| | 1958 | | 1966 | | | |
|---|---|---|---|---|---|---|
| DEPARTMENT | Total | Medicine | Total | Medicine | MAXIMUM | OPTIMUM |
| Chemistry | 1783 | 502 | 2637 | 742 | | |
| Physics | 1482 | 510 | 2190 | 753 | | |
| Botany | 850 | 150 | 1256 | 221 | 600 | 400 |
| Zoology | 939 | 522 | 1387 | 771 | | |
| Anatomy | 927 | 711 | 1370 | 1050 | 850 | |
| Histology | 550 | 430 | 813 | 635 | 200 | 100 |
| Physiology | 883 | 687 | 1305 | 1015 | 400 | 300 |
| Biochemistry | 927 | 687 | 1370 | 1015 | | |
| Pharmacology | 915† | 250 | 1352 | 369 | 100 | 100 |
| Pathology | 270 | 220 | 399 | 325 | 100 | 100 |
| Bacteriology | 270 | 220 | 399 | 325 | 200 | 100 |
| Medicine | 222 | 222 | 328 | 328 | | |
| Surgery | 222 | 222 | 328 | 328 | | |

* The predicted numbers are calculated on a simple proportional basis from the predicted increase in total enrolments in the Sydney University as contained in the Vice-Chancellor's Letter to the Graduates of the Sydney University, April, 1957. The figures for the maximum and optimum are those considered by the Heads of Departments to be compatible with efficiency of teaching and research.

These figures are based upon the lowest estimate of the increase in numbers.

† This figure is due to the large number of Pharmacy students.

TABLE 4

FAILURE RATE EXPRESSED AS A PERCENTAGE OF THE TOTAL NUMBER OF STUDENTS WHO SAT FOR THE EXAMINATION, SYDNEY UNIVERSITY, 1951–1956

| Year of course | 1951 % | 1952 % | 1953 % | 1954 % | 1955 % | 1956 % |
|---|---|---|---|---|---|---|
| First | 45 | 39 | 31 | 44 | 40 | 39 |
| Second | 24 | 30 | 37 | 35 | 34 | 31 |
| Third | 31 | 11 | 15 | 27 | 14 | 9 |
| Fourth | 6 | 5 | 8 | 10 | 5 | 11 |
| Fifth | 0 | 0 | 0 | 0 | 0 | 0 |
| Sixth | 7 | 7 | 5 | 7 | 8 | 6 |

years, and recently it has become increasingly difficult to accommodate students in the lecture theatres in the clinical departments. The absence of a system of selection other than Matriculation Examination has therefore engendered its own problems at Sydney. No one yet knows how the situation is to be tackled. Improved buildings and better accommodation would no doubt help, but clearly the present position is far from satisfactory. This is agreed by all concerned. Overcrowding in the University of Sydney is not confined to the Faculties of Medicine and Science; in the Department of English there are 1,189 students; in History, 1,289; and in Psychology, 1,001. All Faculties are therefore at a disadvantage in several ways; many are thinking of the advantages of a small University—some would say that they are reminded that the ideal university consists of a log of wood with a professor at one end and a student at the other —the emphatic need for more personal contact between teacher and student. Unfortunately, only a small proportion (less than 10 per cent) of the students in Sydney are in colleges.

Controversy has surrounded this problem in Sydney. The University of Sydney has been struggling for ways to circumvent the difficulties. Fortunately, the Murray Report and the resulting aid for staff and buildings has come from action of the Commonwealth Government aided in part by the Government of New South Wales. Mainly as a result of the Murray Report and the development of a financial plan in the pattern of the University Grants Committee, developments are afoot and are likely to move speedily. The University of Sydney will receive its due proportion of aid for staff and buildings, but this will not really rectify the many unwelcome difficulties inherent in a very large medical school. Local views have varied: some have brought hope for another medical school and at the same time a separate and distinct post-graduate school. Probably few had anticipated that in quite a short time the New South Wales University of Technology in Sydney (about 4 miles from the University of Sydney) would be renamed the University of New South Wales and would accommodate a new medical school. In the official statement, the Premier of New South Wales, acting on recommendations submitted by the Minister of Health, Mr. Sheahan, has decreed that hospital facilities should be readily available to meet the clinical requirements for students in the Faculty of Medicine in the new University of New South Wales; that the Prince Henry Hospital be made available to the new University of New South Wales for medical undergraduate teaching and to both the University of Sydney and the new University of New South Wales for post-graduate teaching; and that this new teaching hospital of 720 beds, including 100 beds for infectious cases, shall provide for the appointment of honorary medical staff which should consist of teams of a senior, an assistant member, and juniors, and that the financing of the whole of the activities of the Hospital be done through the Hospitals Committee of New South Wales.

The re-naming of the University of Technology to the University of New South Wales with its Act of Incorporation to redefine its objects and the establishment therein of a Faculty of Medicine has created a quite unique situation. Some hold that, while it now becomes more of an "academic" university, it is still fundamentally a university of technology. In the report of the New South Wales Branch of the British Medical Association on Medical Education, 1958, there is an extended discussion on a "Medical School as an integral part of a university," and evidence is gathered from many Commonwealth sources in support of the (Goodenough) Report of the Interdepartmental Committee on Medical Schools, 1944, that: "only medical schools that are integral parts of universities should undertake the training of undergraduate medical students. To agree to the training of medical students in institutions which are not parts of universities is to support the belief that doctors can be produced in intellectual circumstances that are not the best that the

community provides. We cannot accept such a belief. Medicine is a branch of human thought and activity that demands and provides opportunities for the fullest development of humanistic and scientific talents. It is a branch of higher learning, and the most favorable training ground for those who follow it is in the recognized centers of higher learning—the universities. We are certain that it is as full participants in the life of universities, having close associations with those following other branches of learning, that teachers of medical students will receive the strongest stimulus to give of their best, and medical students will be encouraged to develop those qualities of mind and character that make a good doctor." There is some fear that the new university, being in the main concerned with research and training in the application of science and technology to industry and commerce, and being related to practical applications in a particular field and having as its essential function the training of professional technologists at a high level, may not fully provide for "medicine as a learned profession, one of the branches of higher learning and one of the humane faculties—to place a medical faculty anywhere but in an academic university would be to lower its standing, debase its standards, and diminish the respect in which the profession of medicine is held—to remove it from those attitudes toward learning and the basic scientific and cultural background which an academic university provides." It is suggested that there may be some "blurring of responsibilities" in the grafting of a medical school onto a university of technology and that "if there are serious objections to one institution attempting to combine the functions of a technical college and a university of technology, the establishment of Faculties of Medicine and Arts in a university of Technology would create duality of purpose at another level. If it is right to place these faculties in a university of technology, why not also Faculties of Law and Divinity? Or does the acceptance of Medicine before the others imply that it is to be classed as a technology instead of one of the humane professions? If the others are to come later, the combination of all these with the other subjects for which the University of Technology has made itself responsible would be to create a multiple purpose or omnibus institution—a heterogeneous aggregate without unity of purpose and lacking any consistent underlying philosophy." There are suggestions that the Murray Committee was inconsistent in hinting that a second medical school might be established at the University of Technology when at the same time some condemnation of dual-purpose institutions was expressed. The critics now suggest that the dangers associated with a dual-purpose institution would be even greater in the case of a multi-purpose institution and that its highest subjects would be the first to suffer most. Fears are extended in the following statement "The differentiation *ab initio* of the functions of various institutions—academic universities, universities of technology, and technical colleges—would be the logical and probably, in the long run, the most economical development. It might be claimed that present multiplicity of functions of an institution such as the above is only a beginning in a process of evolution toward a university of traditional type. But this evolution, if it is ever accomplished, is likely to take a very long time, and in the meantime great harm might be done. Such an evolution would therefore be a very wasteful and expensive procedure. In the past it has sometimes proved expedient for universities of traditional type to assume responsibilities for work which could be equally well, if not better, done in other institutions, such as a university of technology."

However, in thinking over all this and the challenge put forward in this new adventure with a new medical school in Sydney, we must remember that the rapid technological advances in the last 2 decades have created skills unknown even a short while ago, and the interplay of these and other factors in current educational trends may offer remarkable possibilities in the evolutional changes which will take place in nearly all

academic disciplines. The impact of newer knowledge and methods of interpretation and research is unavoidable. It has even been suggested that the universities must eliminate anything which aggravates artificial distinction between groups of subjects. Sir Eric Ashby makes note of "The false antithesis between a liberal and a specialised education" and that not only may technology be regarded as one of the ingredients of a liberal education, but by "cementing science and humanism" technology could become "the agent for assimilating the traditional functions of the University into this new age." A major question arises from an expansion of technology in the universities: will faculties of arts be able to save universities from the danger of "responding so readily and efficiently to the short-term demands of technology and a risk of self-disintegration through too facile an adaption to tomorrow's world?" Our medical friends in Sydney might gain some relief from their anxieties by a careful perusal of "Technology and the Academics" and if by chance they should also read an excellent review article on this book by J. J. Allanson in the Universities Review they might be further reassured that any problems and prognostications lying around the interplay of a medical school and a university of technology are well considered, and, to revert to the argument, conditions should be studied toward a provisional choosing of "the humanities which should be made an integral part of higher technological education." It is possible that there is probably scope for less professional departmental hierarchism but for more interfunctional articulation of departments both within the Medical Faculty and other Faculties in the University.

It is fortunate that the new University of New South Wales is in an easily accessible part of the City of Sydney and that there is ample room, on mainly flat land, for extensions and new buildings and in fact for the development of a first-class university campus and where it might lend itself to development whereby no distance separates the university from the medical school and the latter from its hospital: It is certainly true that those are fortunate where all three are adjacent; undoubtedly, where the medical school and university are close the relationship is wholly beneficial and greatly increases the chance of maintaining good basic science departments, and of course "in the interest of teaching and research, for convenience of consultation, and as an intellectual stimulus it is no less desirable that professors in a medical faculty should be in close contact with those of other faculties and the mere question of propinquity is of considerable importance in this connection. Therefore, in order to overcome the isolation of the departments of a medical faculty—especially the premedical and preclinical departments—they should be within the precincts of a university: If we deplore the present tendency to the isolation of students and professors in the Faculty of Medicine, which is partly their own fault in not taking advantage of such opportunities as do exist for making contacts and partly one of the drawbacks incidental to a large university, there is all the greater reason why every effort should be made to overcome or abolish such an evil when planning for a new medical school or university. To establish a medical school completely cut off from the possibilities of contact with other faculties would be not only to acquiesce in, but deliberately to aggravate, an evil. Such an arrangement would reduce a medical school to the level of a medical technical college and would not provide the sort of education needed as a preparation for a profession such as that of Medicine. The simplest answer, next to not having a Medical School at all, is to have the Medical School right in the center of the University proper; then there could be satisfactory integration of students and staff, and facilities for research cooperation and understanding: and to have the teaching hospital in physical proximity or near enough to be very convenient.

Those in Sydney who hoped for a new university and medical school in a different part of Sydney (and some thought Parramatta, in the west part of Sydney, would be

suitable) have been disappointed, especially after their most admirable and careful consideration of all the facts as so clearly set out in the New South Wales British Medical Association Report on Medical Education. One hopes that the new proposals at the new University of New South Wales will open up a quick entry of a full spectrum of Faculties and ample senior, junior, and students common rooms so that any undue emphasis on the "technology" will be absorbed into a wise and learned university in which cross mental fertilization will develop and mature. Medical education could under these conditions throw out some interesting and useful growing points for the betterment of itself and of the other faculties. Certainly, an easy access to experts in modern technological methods—e.g., electronics, and the newer physics, biochemical, and other analytical or synthetic processes, would be no disadvantage to those in the medical school who are searching for more co-relationships in all the sciences: and if all this is tempered with a natural as well as a geographical affinity with humanities in the same campus, no deterioration in medical education need take place. It should be commonly accepted that the adequately prepared doctor should not only be an educated man with a humanitarian outlook, but also have technical skills and wide medical experience.[1] In any case there will always be some medical students who will find a little bias toward the more technical whereas others will be rather inclined to contain within their clinical methods, practice, and experience, a leaning toward the social, environmental, and humanistic attitudes of mind; in fact, an emphasis on a study of people and persons as well as on tangible pathologies. Probably, a medical school is invigorated by this variation among its students and teachers. Experiences dissimilar in character but alike in quality can fit together: this decries a natural existence of inveterate hostility between different categories, whether these be scientific, humane, technical, or religious. Those who want a literary component in the scientist's education do so, not from any vague idea of general education or the "rounded" man, but because they see it as an essential preservative of the sense of complex actuality in an education otherwise apt to dissolve existence into "a world of formulas." It is to be hoped that the Premier of New South Wales will never have any regrets in regard to the anticipated "new look" in the new University of New South Wales.

There is some disappointment that the views of the Post-Graduate Committee in Medicine in Sydney were not implemented: they were that "a post-graduate hospital is as necessary to post-graduate medical education as teaching hospitals are for undergraduate education and that it must have its *own* special features of staffing and organisation." There is no doubt about the disappointment of the Post-graduate Committee: this Committee does not think that the proposals by the Premier will in fact provide real facilities for postgraduate medical education in Sydney, and the current view is that it will merely add the services of another undergraduate teaching hospital, of which the Post-Graduate Committee has already the services of seven hospitals which are "unable to cater for its special needs."

Perhaps also the wishes of the Post-Graduate Committee in Medicine in Sydney to have a separate hospital for postgraduate medical education will one day be allowed. It is possible that Dr. V. M. Coppleson is right when he states that "it is generally recognised that it is not easy to combine under-graduate and post-graduate education. The view of the Post-Graduate Committee is that a post-graduate hospital is as necessary to post-graduate medical education as teaching hospitals are for undergraduate education and that it must have its own special features of staffing and organisation."

The effect of the lack of such a hospital in New South Wales has now become apparent. The Committee has reached a stage when

[1] Medical curricula have unique features insofar as each combines both university education and vocational training.

it is no longer able to meet the demands or provide adequate practical postgraduate training for the needs of the general practitioners who form the bulk of the medical profession. Without a postgraduate hospital, the Committee is limited to lecturing—whereas its greatest need is facilities for clinical study and training. The large numbers of students graduating are putting an increasing strain on the postgraduate facilities of this State and making a provision of a strong postgraduate school even more necessary.

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# A Study of Attitudes and Anxiety in Medical Students*

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Recent interest in the ecology of the medical student[1] has focused in part on the change in attitudes brought about by medical education. Eron (2) has offered evidence that: (*a*) senior medical students are more cynical than freshmen; (*b*) this greater cynicism among seniors is paralleled by greater manifest anxiety; (*c*) senior medical students who are lowest in anxiety have higher scores on humanitarianism.

Cynicism has been defined by Eron as "a contemptuous disbelief in man's sincerity of motives or rectitude of conduct, characterized by the conviction that human conduct is suggested or directed by self-interest or self-indulgence."

Humanitarianism is defined as "a regard for the interests of mankind, benevolence, philanthropy" (3).

During an attempt to evaluate effects on student attitudes of the Family Health Program at the University of Louisville Medical School—a program designed (in part) to develop more humanitarian attitudes on the part of students—preliminary testing was carried out with these cynicism and humanitarianism scales on a number of sophomore and senior students. Anxiety was also assessed, by a different instrument[2] from that used by Eron, however.

* Supported by a grant from the W. K. Kellogg Foundation, Battle Creek, Michigan.

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[1] The Ecology of the Medical Student. J. M. Educ., 33:19, 1958.

[2] IPAT Anxiety Scale, Institute for Personality and Aptitude Testing, Champaign, Ill., 1957.

Analyses and comparisons of these results may be of value in respect to both the generality of previous findings in different settings and the generality of results with a different measure of manifest anxiety.

*Method.*—The entire sophomore class of 90 was given a number of group tests of attitudes and values, including the cynicism, humanitarianism, and anxiety scales referred to. Students were tested in groups, half the class at one session and half at a later session. The seniors were tested in smaller groups of intact sections, about ten to fifteen at a time, and scores from a total of 29 seniors were obtained.

Students' papers were identified by number only, and comparisons were made by extracting various groups from the total distribution after completion of testing.

*Results.*—(*a*) As shown in Table 1, there were no significant differences between senior and sophomore means on the three scales. It appears that seniors may be slightly more anxious and slightly less cynical, but these may be only chance trends. (*b*) Since the number of senior students was small, an attempt was made to relate the three variables within the sophomore group. The "High Anxious" included those making one of the top four standard scores rather than the ten highest scores, which was the criterion used by Eron. Consequently, there were 23 individuals in the High Anxious group and 23 in the Low Anxious group. Table 2 shows that the High Anxious sophomores were significantly more cynical than the Low Anxious. As a check on the relation between the two variables, a correlation co-

efficient for anxiety and cynicism was obtained within the sophomore group. The $r$ was only .32 but indicates a trend in the direction of higher anxiety accompanying greater cynicism. (*c*) There was no difference in humanitarianism between the highest and lowest anxiety groups.

Eron has also made an attempt to relate cynicism, humanitarianism, and anxiety to student academic success. In a slightly different approach to this problem, the question was asked whether there would be a significant difference in attitudes among those students who are on probation as compared with those who are successfully meeting academic requirements.

As shown in Table 3, students on probation are significantly *less* anxious than those who are more successful. However, the correlation between class standing and anxiety is only .17. There were no significant differences between probationers and nonprobationers on cynicism or humanitarianism.

*Discussion.*—The fact that seniors were not found to be more cynical than the sophomores tested may be due to several factors not necessarily in contradiction to previous findings of greater cynicism among seniors than among freshmen. This particular sophomore class may contain unusually cynical students, not typical of sophomores in general. Or, it is possible that cynicism is at its height during the second year of medical school, dropping again, but to a point higher than it was during the first year.

In support of the latter hypothesis is the

TABLE 1

ATTITUDE AND ANXIETY TEST SCORES OF SENIOR AND SOPHOMORE MEDICAL STUDENTS

| | Anxiety | | | Cynicism | | | Humanitarianism | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | S. D. | N | Mean | S. D. | N | Mean | S. D. | N |
| Seniors | 30.3 | 7.4 | (14) | 129.6 | 23.7 | (29) | 116.5 | 16.3 | (29) |
| Sophomores | 27.4 | 9.3 | (89) | 136.5 | 35.1 | (90) | 117.7 | 15.8 | (90) |
| Diff.= | 2.9 | | | 6.9 | | | 1.2 | | |
| $t$= | 1.31 | | | 1.20 | | | <1.00 | | |
| P= | N.S. | | | N.S. | | | N.S. | | |

TABLE 2

SCORES OF HIGH AND LOW ANXIOUS SOPHOMORES ON CYNICISM AND HUMANITARIANISM

| Anxiety group | Cynicism | | | Humanitarianism | | |
|---|---|---|---|---|---|---|
| | Mean | S. D. | N | Mean | S. D. | N |
| High | 148.5 | 34.03 | (23) | 120.2 | 16.16 | (23) |
| Low | 112.9 | 26.38 | (23) | 120.0 | 14.61 | (23) |
| Diff.= | 35.6 | | | .2 | | |
| $t$= | 22.0 | | | — | | |
| P= | <.001 | | | — | | |

TABLE 3

ATTITUDE AND ANXIETY TEST SCORES OF PROBATIONERS AND NON-PROBATIONERS AMONG SOPHOMORE MEDICAL STUDENTS

| | Anxiety | | | Cynicism | | Humanitarianism | | |
|---|---|---|---|---|---|---|---|---|
| Group | Mean | S. D. | N | Mean | S. D. | Mean | S. D. | N |
| Probationers | 23.2 | 7.54 | (18) | 139.9 | 37.02 | 113.7 | 13.95 | (18) |
| Non-probationers | 28.5 | 9.40 | (72) | 135.7 | 34.69 | 118.7 | 16.17 | (72) |
| Diff.= | 5.3 | | | 4.2 | | 5.0 | | |
| $t$= | 2.53 | | | .44 | | 1.30 | | |
| P= | <.05>.01 | | | N.S. | | N.S. | | |

fact that, when group means were compared with those found in Eron's study, the senior averages on cynicism were found to be approximately the same, whereas the mean of sophomores was 136.5 as compared with the previously reported freshman mean of 114.5 (Table 4). Both sophomores and seniors in the Louisville study have a lower mean on humanitarianism than the freshmen and seniors reported by Eron (Table 5).

Follow-up studies consisting of retesting of these same students at the end of the junior year and further testing of other freshmen and senior classes may serve to clarify these differences and establish trends. It would appear that the validity of such a relation between manifest anxiety and cynicism is considerably enhanced by similar findings with the use of two different instruments to assess anxiety. The correlation of .32, while not high, may be regarded as significant considering the multiplicity of variables which are probably involved.

This result might be interpreted as lending support to the hypothesis that cynicism is used as a defense against increasing anxiety engendered by medical school experience. However, there are several factors which tend to cast doubt on such reasoning: First, the senior medical students tested were not more anxious nor were they more cynical than the sophomores. Second, although students on probation were significantly less anxious than the other students, they were not significantly less cynical.

It is clear that students who were failing to meet academic requirements were significantly less anxious than the more successful students, although the correlation between anxiety and class standing is low, This finding is in line with other studies (1, 4, 5, 6) indicating that a certain amount of anxiety is conducive to learning.

TABLE 4

SCORES OF MEDICAL STUDENTS ON CYNICISM SCALE

| | Freshmen | | Seniors | | Sophomores | |
|---|---|---|---|---|---|---|
| Group | Mean | S. D. | Mean | S. D. | Mean | S. D. |
| Yale study* | 114.45 | 21.97 | 125.86 | 20.78 | — | — |
| Louisville study | — | — | 129.6 | 23.7 | 136.5 | 35.1 |

* Eron, 1958.

TABLE 5

SCORES OF MEDICAL STUDENTS ON HUMANITARIANISM SCALE

| | Freshmen | | Seniors | | Sophomores | |
|---|---|---|---|---|---|---|
| Group | Mean | S. D. | Mean | S. D. | Mean | S. D. |
| Yale study* | 122.18 | 16.09 | 124.43 | 14.12 | — | — |
| Louisville study | — | — | 116.5 | 16.3 | 117.7 | 15.8 |

* Eron, 1958.

*Summary.*—Results of attitude testing of senior and sophomore medical students suggested several trends in regard to cynicism, humanitarianism, and anxiety.

1. Among the highest and lowest scores on anxiety there was a significant difference in cynicism, the more anxious being also the more cynical.

2. Students who were successfully meeting academic requirements were significantly more anxious than those who were on probation.

3. There were no significant differences between seniors and sophomores.

Further studies are planned to evaluate the effect of a Family Health Program which aims at developing more humanitarian attitudes in students.

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# Teaching of Undergraduate Psychiatry at the Universidad Del Valle Medical School

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Traditionally, in Latin American countries, psychiatry has been taught during the fifth or sixth year of medical school, together with all the clinical specialties, with a weekly schedule of no more than two 1-hour sessions, predominantly theoretical and speculative. Utilization of clinical material has been limited to sporadic case demonstrations or presentations, with no participation by the students in hospital work and the clinical management of patients. The abrupt confrontation with clinical entities, for the understanding of which the student has had neither basic knowledge nor objective experience, has been responsible for the general attitude of regarding psychiatry as an esoteric discipline and the realm of a few initiates, rather than as a crucial element in medical formation and an indispensable instrument for the understanding and solving of the huge number of human problems that the physician faces in the practice of his profession.

In view of the ever-growing evidence that the problem of disease seems to be the end-result of the interaction of individual, social, and environmental factors, renewed efforts have been made to include studies of a humanistic nature among the medical courses aimed at developing a comprehensive understanding of man—sick or not—in his milieu.

* Chairman, Department of Psychiatry.

As a response to this movement, substantial changes have occurred in the academic organization of medical schools which, by virtue of their nature and functions, have affected the Departments of Psychiatry and Preventive Medicine most noticeably.

The Department of Psychiatry of Universidad del Valle, keenly aware of the need to provide the general practitioner with a minimum of knowledge to guide him through a study of the differences in personality and individual behavior, and how these become causal factors for health and disease, decided that it was advisable to extend the teaching of psychiatry to the pre-clinical years. Thus, the student receives adequate instruction in basic behavioral sciences as a preparation for Clinical Psychiatry proper, the learning of which is predominantly objective and reinforced with intensive hospital work throughout the clinical years.

A program so conceived comprises the following courses:

*Psychobiology* (second year).—This course should be considered as a fusion of Human Biology and Medical Psychology, united in an effort to outline a comprehensive and harmonic understanding of the growth and development of human personality. Throughout the course, interest is focused on the study of the different modalities of human behavior with reference to the aspects of the structuring, evolution, and organization of the adaptive processes in human beings and to the peculiarities of each developmental stage. Emphasis is given to the discussion of how the social and cultural influences of the environment operate as

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# Teaching of Undergraduate Psychiatry at the Universidad Del Valle Medical School

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modifying forces upon the basic biological needs.

The didactic material is delivered in 32 lectures in which stress is put on integration with the basic sciences of biology, morphology, and anthropology, with the aim of developing a unitarian-dynamic criteria for dealing with medical problems. The topics related to sociology, anthropology, and human ecology are treated by visiting professors or staff members from other departments. The course is supplemented with five 2-hour seminars (which will probably be increased to ten or fifteen) on social psychology held in cooperation with the Department of Preventive Medicine. The material for discussion comes from observations the students make during the visits to the homes of families in the Family Care Program of the Department of Preventive Medicine.

Total number of hours: Lectures: 32; Seminars: 10.

Total number of hours for the second year: 42.

*Psychopathology* (third year).—Conceived as the study of the deviations from normal individual behavior and development, the course deals with methods of recognizing the adaptive failures, their origins, evolution, and goals as reflected on the different stages of human life. Particular emphasis is given to the problem of interpersonal relations and the conditions that promote or obstruct them, especially in the field of doctor-patient relationships. The pathology of the different psychic functions is reviewed extensively and the study of psychiatric syndromes is started with the help of objective demonstrations. Tape recordings of psychotic and neurotic patients interviewed by staff members are used for this purpose. Since the chosen cases are clearly demonstrative, a careful analysis of every individual symptom is attained, without the inconvenience of case presentations in which patients may become unproductive or uncooperative. Furthermore, since the students are not trained as yet in the techniques or methods of observations, assuming that it is impossible to point out the symptoms at the moment of the case presentation, much valuable material would be lost if patients were used for demonstration. It is planned to supplement these practices with movies in the future.

The course is made up of 32 lectures plus an average of eighteen 2-hour sessions held every 2 weeks with groups of twelve to fifteen students. In these sessions an individual analysis is made of the interrelation between the students and the patients they see in the wards during their work in physical diagnosis. Experience shows that initial contacts with patients can be very traumatic for the medical student, the resulting anxiety being perpetuated through a number of miscarried attempts at correction which frequently cause permanent damage to his ability to relate to people adequately. All sorts of emotional reactions and attitudes involved in the relationship are thoroughly discussed, and self-examination is encouraged. Corrective measures are suggested if necessary. At times the meetings become indistinguishable from typical group therapy sessions. However the aim is limited only to promoting the development of those habits and attitudes which facilitate communication in the clinical interview. The students become familiar with adequate techniques for handling the patients' anxiety as well as their own through discovering that mutual personality factors may be interfering with a successful relation. They also learn that by solving these basic problems an optimum of efficacy and objectivity can always be achieved.

Total number of hours: Lectures: 32; Seminars: 36.

Total number of hours for the third year: 68.

*Clinical psychiatry* (fourth year).—During this year a comprehensive review is made of all the clinical psychiatric entities with emphasis on the aspects relevant to the clinical work of a general practitioner. A basic understanding of the most frequent forms of psychoses and psychoneuroses is the ultimate aim of the course, but at the same time efforts are made to make the student realize

the importance of using interpersonal relations as an effective therapeutic agent.

The most important task assigned to the students during this period is the writing of complete personality evaluations ("psychiatric histories") on each one of the patients they handle in the medical or surgical wards of the General Hospital. This task, supervised by the Department of Psychiatry, gradually induces the student to regard medical problems as arising from a truly psychosomatic functional unity.

The course is given in weekly 3-hour sessions, in which 1 hour is used for an introductory lecture, 1 hour for case presentation, and 1 hour for a seminar-type discussion. The first part of the course, dealing with psychoneurosis, psychophysiological reaction, and personality disorder, is given at the General Hospital; and the second part, dealing with psychosis, at the Psychiatric Hospital. Since at this stage of his formation the student has already become familiar with all the methods of observation and handling of patients, clinical demonstrations of the different entities can be freely made.

Total number of hours for the fourth year: 105.

*Clerkship in Clinical Psychiatry* (fifth year).—During this period, the students follow a program of full-time work (8 hours a day) in psychiatric services. They are divided in small groups and rotate through these services for a length of 2 weeks each. At the Psychiatric Hospital, clinical cases are assigned to them for study and individual discussion in subsequent sessions. Each student is supposed to study the case on his own and then present his ideas in a group meeting where they are discussed. Care is taken that cases assigned to the students be demonstrative of the various psychiatric entities, and comparison with other, less demonstrative ones is made.

Work with out-patients is performed in the clinics of both the Psychiatric and General Hospitals, with the following program:

*a*) Hospital work with in-patients: The students participate in all the clinical procedures used in the hospital. Emphasis is laid on an accurate history-taking which includes interviews with relatives of patients. Supervision for the clinical work is provided by interns, residents, and staff members. *Time: 14 hours a week; total number of hours, 56.*

*b*) Special interviews: These are devoted to giving formal psychological examinations or psychotherapy to selected cases. *Time: 4 hours a week; total number of hours, 15.*

*c*) Out-Patient Clinic-Psychiatric Hospital: This is a service designed primarily to treat ambulatory psychotic patients, those who are on the waiting list for admission, or those who come after discharge for follow-up and control. Direct supervision is provided by staff members. *Time: 6 hours a week; total number of hours, 24.*

*d*) Out-Patient Clinic, "Hospital Departamental Universitario": Ambulatory psychotics, psychoneurotics, and those with behavior problems are seen in this clinic. However, most of the patients are "psychosomatic" cases who have been referred directly to this clinic or sent there after hospitalization and discharge from the medical or surgical wards. Individual supervision is provided by the staff. *Time: 6 hours a week; total number of hours, 24.*

*e*) Ward rounds and case presentation: Cases are presented and discussed in regard to diagnosis, prognosis and treatment. It is requested that a complete work-up be performed before cases are presented. Ideal requirements should be complete laboratory work and psychological tests. *Time: 2 hours a week; total number of hours, 8.*

*f*) Seminars: Reading assignments on topics related to clinical psychiatry are given to the students for subsequent discussion in weekly meetings in which the staff and professional personnel participate. *Time: 2 hours a week; total number of hours, 8.*

*Note:* Starting in the academic year 1959–1960, during the 12-week period when the students serve their clerkship in Internal Medicine, they will participate in a weekly, 2-hour session of "psychosomatic ward rounds," in which demonstrative cases in the medical wards will be discussed in joint

meetings by members of the two departments. They will also be required to attend the out-patient clinics for study and follow-up of "psychosomatic" cases.

*Psychosomatic ward rounds: 2 hours a week; total number of hours, 24.*

*Out-patient Clinic: 3 hours a week; total number of hours, 36.*

*Total number of scheduled working hours for the fifth year: 195.*

*Internship in Psychiatry* (sixth year).—During this period the students are assigned to full-time work (the entire day, night calls when on duty) in psychiatric services for a period of time that, beginning in the academic year 1959–1960, will be reduced from 6 to 4 weeks according to arrangements made with the Department of Internal Medicine (see note below). Students are responsible for admissions, clinical work, and therapeutic procedures under supervision by the staff. It is hoped that at the end of this period the students will have become familiar with all current diagnostic and therapeutic procedures commonly used in psychiatric practice. The following program is in effect:

*a*) Hospital work with in-patients: Students are responsible for the complete clinical care of hospitalized patients, including specialized therapeutic procedures such as electro-convulsive therapy and insulin therapy, which are administered by them. Careful history-taking and interviews with relatives are regarded as very important duties. Interviews with hospitalized patients follow a flexible (individualized) schedule. *Time: weekly minimum, 32 hours; total number of hours, 128.*

*b*) Special interviews: These are used for psychological testing or psychotherapy sessions with cases selected from among the in-patients. *Time: 4 hours a week; total number of hours, 16.*

*c*) Out-patient Clinic Psychiatric Hospital: This service is designed primarily for the treatment of ambulatory psychotics, of those who are on the waiting list for admission, or those who have been discharged from the hospital and scheduled for follow-up and control. Direct supervision by the staff is provided. *Time: 6 hours a week; total number of hours, 24.*

*d*) Out-Patient Clinic "Hospital Departmental Universitario": Interns in this service deal with patients belonging to the following categories: ambulatory, psychotics, psychoneurotics, behavior problems, "psychosomatic" cases, children with psychiatric problems and their parents. Arrangements are being made with the Department of Pediatrics to organize a special out-patient service for child psychiatry. *Time: 6 hours a week; total number of hours, 24.*

*e*) Ward-rounds and case presentations: All the cases assigned must be presented in these sessions, after a complete work-up. Emergency treatments which the patients may have received are thoroughly discussed as well as diagnosis, prognosis, and long-term treatment. *Time: 6 hours a week; total number of hours, 24.*

*f*) Case presentation for academic demonstrations: Interns and residents are required to select particularly demonstrative clinical cases to be used as didactic material for the course in Clinical Psychiatry (fourth year). When an intern is assigned a patient for demonstration, he is supposed to make an exhaustive study of the case so as to provide the students with a clear and complete description. *Time: 1 hour a week; total number of hours, 4.*

*g*) Seminars: Depending on the particular needs, these are held jointly with the fifth-year students or independently; special emphasis is laid on therapy of psychiatric disorders. *Time: 2 hours a week; total number of hours, 8.*

*Note:* According to arrangements made with the Department of Internal Medicine, the period for interns to rotate through psychiatry will be reduced from 6 to 4 weeks starting in the Academic Year 1959–1960. To compensate for this, the interns will have a weekly 2-hour session of "psychosomatic" ward-rounds (together with the fifth-year clerks) and 3 hours of out-patient clinic for study and follow-up of "psychosomatic cases" throughout the 12-week period when they are assigned to Internal Medicine.

It is felt by the two departments that this measure can greatly contribute to the integration of the two disciplines and provide the students with a truly comprehensive program for the understanding and management of medical, psychological, and social problems in which the continuity of the students-patient relationship is the dominant key. *Time: "Psychosomatic" ward-rounds, 2 hours a week; total number of hours, 12; and for "Psychosomatic" out-patient clinics, 3 hours a week; total number of hours, 36.*

Total number of scheduled working hours for the sixth year: 276.

TOTAL NUMBER OF HOURS FOR UNDERGRADUATE PSYCHIATRY: 686.

# A Student Laboratory Experiment in Chemotherapy

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Many problems beset student laboratory experiments in pharmacology, but particularly in the area of chemotherapy is it difficult to establish a dependable procedure by which the students can obtain reasonably satisfactory data. The experiment described in this paper is the outgrowth of several semesters' use and continued modification in the pharmacology laboratory for second-year medical students and senior pharmacy students.

*Method.*—Mice which have died of an infection of *Diplococcus pneumoniae* Type II are stored in a deep freeze. One week prior to the date on which the experiment is scheduled in the pharmacology laboratory, a mouse is taken from the freezer, and its brain is removed. A suspension of brain is prepared, incubated at 37° C. in Brewer's fluid thioglycollate medium for 6 hours or more, and then streaked on blood plates. After overnight incubation, organisms are washed from a blood plate with a few milliliters of saline, and mice are given inoculations of the suspension, with 0.1 ml. inoculum used per mouse. Additional animal passages of the pneumococci are made by inoculating mice with peritoneal washings from mice that are either sick or dead because of the infection. After several passages through mice the brain of an infected mouse is streaked on a blood plate, and the plate is incubated overnight. From this plate a pneumococcal colony is selected and inoculated into brain-heart-infusion medium enriched with rabbit serum. This culture is incubated for 6–18 hours, after which serial dilutions through $10^{-6}$ or $10^{-7}$ are prepared in brain-heart-infusion medium and used at once to inoculate mice for the chemotherapeutic experiment. Better results seem to be obtained if the culture to be diluted is less than 12 hours old.

Student participation in the experiment begins with their injecting mice intraperitoneally with 0.2 ml. of each serial dilution. In practice, mice, weighing approximately 15 gm. each, are brought to the laboratory in as many cages as needed to set up the experiment as planned, and each student team injects the mice of one cage with a particular dilution of pneumococci. After inoculation of the mice, cages are arranged in three groups, each group including a cage for each of the serial dilutions. Group I is set aside as the untreated controls and includes a cage of mice inoculated with one dilution greater than the greatest dilution included in the other two groups. Treatment of Groups II and III is withheld for 60–90 minutes after inoculation. The mice in Group II receive 0.25 mg. of sodium penicillin G, equivalent to approximately 400 units, intraperitoneally. The metallic salt is made up as a 1 mg/ml aqueous solution. The mice in Group III receive both 0.25 mg. of sodium penicillin G intraperitoneally and 1.6 mg. of procaine penicillin G, equivalent to approximately 1600 units, intramuscularly. Twenty-four hours later, Group III mice receive an additional 1.6 mg. of procaine penicillin G, intra-

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muscularly. The procaine salt is prepared as an 8 mg/ml aqueous suspension. Both the sodium and procaine salts are commercial products, which have been purchased from Nutritional Biochemicals Corp., Cleveland, Ohio. Throughout the course of the experiment, mice are provided with standard laboratory chow pellets and water ad libitum. Mortality is followed at convenient time intervals for 72–96 hours after inoculation.

*Results.*—Typical data reported herein are those obtained during the 1958–59 academic year. Table 1 provides the results from the experiment carried out with senior pharmacy students in December, 1958, while Table 2 contains the data from the

TABLE 1

PENICILLIN VS. PNEUMOCOCCAL INFECTIONS IN MICE
DECEMBER 17 TO 21, 1958

| | Serial dilution | Per cent mortality at indicated hours | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 18 | 24 | 27.5 | 42 | 48 | 51.5 | 66 | 72 | 75.5 | 96 |
| Group I | $10^{-1}$ | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| (30 mice) | $10^{-2}$ | 80 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Untreated | $10^{-3}$ | 60 | 80 | 80 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| controls | $10^{-4}$ | 60 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | $10^{-5}$ | 0 | 60 | 60 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | $10^{-6}$ | 0 | 60 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Group II | $10^{-1}$ | 0 | 0 | 20 | 80 | 100 | 100 | 100 | 100 | 100 | 100 |
| (25 mice) | $10^{-2}$ | 0 | 0 | 60 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Treated with | $10^{-3}$ | 0 | 0 | 0 | 60 | 100 | 100 | 100 | 100 | 100 | 100 |
| Na Penicillin G | $10^{-4}$ | 0 | 0 | 0 | 80 | 80 | 80 | 100 | 100 | 100 | 100 |
| | $10^{-5}$ | 0 | 0 | 0 | 40 | 40 | 60 | 60 | 80 | 80 | 80 |
| Group III | $10^{-1}$ | 0 | 20 | 40 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| (25 mice) | $10^{-2}$ | 0 | 0 | 0 | 0 | 40 | 40 | 60 | 80 | 100 | 100 |
| Treated with | $10^{-3}$ | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 60 | 60 | 60 |
| Na Penicillin | $10^{-4}$ | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 40 | 40 | 40 |
| and Procaine | $10^{-5}$ | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 40 | 40 | 40 |
| Penicillin G | | | | | | | | | | | |

TABLE 2

PENICILLIN VS. PNEUMOCOCCAL INFECTIONS IN MICE
MAY 4 TO 8, 1959

| | Serial dilution | Per cent mortality at indicated hours | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 | 12 | 24 | 30 | 48 | 54 | 72 | 78 | 96 |
| Group I | $10^{-1}$ | 0 | 0 | 80 | 100 | 100 | 100 | 100 | 100 | 100 |
| (70 mice) | $10^{-2}$ | 0 | 0 | 90 | 100 | 100 | 100 | 100 | 100 | 100 |
| Untreated | $10^{-3}$ | 0 | 0 | 50 | 90 | 100 | 100 | 100 | 100 | 100 |
| controls | $10^{-4}$ | 0 | 0 | 90 | 100 | 100 | 100 | 100 | 100 | 100 |
| | $10^{-5}$ | 0 | 0 | 80 | 90 | 100 | 100 | 100 | 100 | 100 |
| | $10^{-6}$ | 0 | 0 | 30 | 80 | 100 | 100 | 100 | 100 | 100 |
| | $10^{-7}$ | 0 | 0 | 70 | 100 | 100 | 100 | 100 | 100 | 100 |
| Group II | $10^{-1}$ | 0 | 0 | 30 | 70 | 100 | 100 | 100 | 100 | 100 |
| (60 mice) | $10^{-2}$ | 0 | 0 | 0 | 40 | 100 | 100 | 100 | 100 | 100 |
| Treated with | $10^{-3}$ | 10 | 10 | 20 | 80 | 100 | 100 | 100 | 100 | 100 |
| Na Penicillin G | $10^{-4}$ | 0 | 0 | 0 | 30 | 40 | 40 | 40 | 40 | 40 |
| | $10^{-5}$ | 0 | 0 | 0 | 0 | 10 | 10 | 20 | 20 | 20 |
| | $10^{-6}$ | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 10 | 10 |
| Group III | $10^{-1}$ | 0 | 0 | 0 | 20 | 70 | 80 | 90 | 100 | 100 |
| (60 mice) | $10^{-2}$ | 0 | 0 | 0 | 10 | 10 | 30 | 80 | 80 | 80 |
| Treated with | $10^{-3}$ | 0 | 0 | 0 | 20 | 50 | 60 | 70 | 80 | 90 |
| Na Penicillin | $10^{-4}$ | 0 | 0 | 0 | 0 | 0 | 20 | 20 | 20 | 20 |
| and Procaine | $10^{-5}$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Penicillin G | $10^{-6}$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

May, 1959, experiment with second-year medical students. The percentages in Table 1 are based upon five mice for each serial dilution in each group, whereas there are ten mice per category in Table 2. In both tables it is apparent that the infection, even in the mice receiving the most dilute inoculum, is fatal to the untreated mice within 48 hours after inoculation. On the other hand, even the mice which receive only the single injection of sodium penicillin G show both a delayed mortality in the lower dilutions and an over-all decreased mortality. The mice in Group III demonstrate the requirements of adequate therapy, because in this group both the onset of death is delayed and the total number of deaths is decreased.

*Comments.*—There are features of this experimental procedure which are well suited to a student experiment and thus deserve elaboration.

1. Use of the serial dilution method obviates the need for attempting a quantitation of the number of viable organisms in the culture prior to inoculation. Serial dilution tends to compensate for variations in both the pneumococcal population and virulence of the cultures available from semester to semester.

2. Since several individuals make the inoculations and inject the drugs, there is obviously opportunity for considerable error and variation. However, the consistency and reproducibility of the results of several semesters substantiate the validity of the method for purposes of a student experiment.

3. Another point in favor of the serial dilution is that it presents the students with mice with varying degrees of infection. This is comparable to the situation in clinical practice, because all patients manifest varying degrees of morbidity. Furthermore, it points out the fact that some mice, and patients, will die in spite of therapy, particularly if the treatment is inadequate.

4. The 60- to 90-minute period between inoculation and drug administration is essential to allow the infection to establish itself in the mice. In this way the mice are "sick" before they receive any therapy. This too is comparable to the clinical situation in which the student will ultimately be confronted with established, if not full-blown, infections, rather than incipient ones.

*Summary.*—The student experiment in chemotherapy as outlined here provides one which dependably and very dramatically points out the effectiveness of penicillin in prolonging the survival time of mice suffering from an induced pneumococcal infection. Furthermore, the data indicate that inadequate therapy cannot cope with a fulminating infection, and that intensive therapy early in the course of an infection is necessary to arrest the disease process.

This procedure is sufficiently flexible to allow for any of several variations (dosage schedule, dosage forms of penicillin, or other chemotherapeutic agents) that a department may wish to institute in its own laboratory course.

ACKNOWLEDGMENTS

The authors wish to recognize the significant suggestions made by Dr. Martin R. Ross, formerly a member of the Department of Microbiology, and also to recognize that the nucleus of the experiment was provided by Dr. Frederick Bernheim, Professor of Pharmacology, Duke University School of Medicine, and the laboratory portion of his pharmacology course.

# The Medical Student and Human Relations

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The changing concepts underlying the present practice of medicine must eventually be reflected in the emphases and trends of medical education. In his recent book *The Matrix of Medicine* Malleson (9) shows how from the time of Pasteur the old concepts of "constitution" and "diathesis" gave way to a study of specific disease entities. The post-Pasteurian century resulted in a conquest of disease in the Western world which is one of the finest achievements of man. "This triumphant progress of pathology and therapeutics inevitably produced an apposite attitude in the minds of doctors: both in research, in treatment and prevention, the 'lesion' received more attention than the patient." With the burden of the more straightforward diseases relieved, we become increasingly concerned with the residue of those conditions which do not fit the pattern of a single cause and a single cure. The present-day physician finds he is obliged to deal less with cases, and more with men and women whose harmonious progress through life has been interrupted. Consequently, he finds that human relations and social arrangements have become often more important than his prescription. "Leaving aside the organic processes of senescence, once we have got the cure for cancer there will be no common major condition left in which stress does not appear to play an important causal part. Small wonder that this 'stress,' so ill-defined, so widespread and apparently so much a product of modern industrial society, should come to be the major concern of an ecological approach to medicine."

The implications for medical education that follow are, first, the importance of the personality of the medical student and, second, the need to pay attention to his training in human relations.

This paper will discuss some personality factors which influence the interests and learning behavior of medical students and their orientation to patients. The importance of the student's appreciating the psychological and social aspects of the patient's situation will then be discussed. Those facets of the student's learning milieu which are concerned with this aspect of his development will be looked at. The objectives of medical student training in human relations and the concepts, skills, and experience which he will need to acquire will be set out.

*Basic personality factors.*—By the use of psychological tests students with clusters of certain personality traits have been identified (12). Some of the characteristics of the identified groups are as follows: The S's ("stereopaths") show depersonalization of relationships in their reactions to others. Their aggression is expressed in attempted dominance and control. They manipulate things and people as external objects through practical, concrete, physical action. They are inaccessible to new experience, resist departure from tradition, are rigid and compulsive. The N's ("non-stereopaths") show highly personalized relationships in their reaction to others. They are generally characterized by the maintenance of good contact and rapport with others and place great emphasis on interpersonal relationships. They are capable of responsibility and emotional maturity and identify with the "underdog." They are flexible and adaptable to changing circumstances.

These personality variations will influence to some extent the interests and performance of medical students. Students with diverse personality characteristics learn differently in various types of classroom situations (13). The ability to learn one or other subject may also be related to personality variations. Students who have a strong need to understand their own and others' feelings and motives have a high need for "intraception" and in the teaching of psychiatry present quite a different problem from students with relatively weak needs for intraception (4). His personality will also play some part in the medical student's final choice of graduate sphere of practice.

*Student orientations to patients.*—Students often encounter difficulty in relating to patients who make them feel anxious. The problem of defending against patient-induced anxiety is especially acute for the medical student because of his necessarily limited experience and competence. As he learns to handle his anxieties the student acquires attitudes of a defensive nature toward those types of patients he finds especially threatening. In a recent investigation students described their conceptions of three types of patients: an ideal patient, a typically organically ill patient, and a typically emotionally ill patient presenting complaints similar to those of the organically ill patient (5).

The ideal patient was viewed as entirely sensible, as making minimal demands on his physician and as calmly accepting whatever results his treatment produces. He presents no feelings or attitudes which in any way threaten his physician or complicate treatment. The organically ill patient, although depicted as more dependent on his physician and more concerned over his illness, has nonetheless positive attitudes toward his treatment and his doctor. The emotionally ill patient was collectively characterized by attitudes which tended to hinder treatment and to threaten his physician. In general terms, the differences in their orientation to emotionally ill patients indicate the diverse attitudes, values, and expectations which students may bring to the doctor-patient relationship. "In this relationship the doctor deals with the essentially human dimensions of illness which are manifested in his patient's personal feelings and attitudes about his disease, about the environment in which he plays a sick role, and about the doctor himself."

The importance of understanding the psychological and social components of a patient's situation can be referred to as "patient-orientation." "One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is in caring for the patient" (11).

Two pertinent questions present themselves when one thinks of the medical student and "patient-orientation." Can he be and is he trained to consider the psychological and social aspects of patients and their experiences with medical personnel and agencies? Does his learning environment assist him to acquire this understanding and incorporate it into his growing body of skills?

*The learning situation.*—As a background to the curriculum is the social situation in which learning takes place. Every medical school forms a cultural milieu, and from this the student acquires some of his information, without design or effort (6). "Only parts of the information displayed before the student in this way have been deliberately designed by the teaching body with the same conscious discrimination as has the structure of the curriculum. Much of it, many basic unquestioned assumptions and attitudes, the teachers express inadvertently through their personalities."

Many factors contribute to the nature of the behavior a young doctor adopts with patients. It is determined by what he has been exhorted to follow, by the ways he has witnessed his teachers behaving and "that he is invited to imitate, and also by how his elders have treated him when he was in their care, as the patient now is in his. A student learns far more from his teachers than what is prescribed in the medical curriculum and

what he learns inadvertently should be scrutinised just as carefully as what he learns by intent."

Every doctor is able to recall some events in his training which illustrate poor or good understanding of the patient by the teacher. Examples of the latter are the first ward round consisting of a talk on the meaning of his bed to the patient and pointing out the effects of its thoughtless disturbance, of a teacher patiently explaining the discovery of insulin and its effects to a non-cooperative diabetic patient, of the elucidation of the direct correlation between the exacerbations of a woman's ulcer and the interval of time since last she had received a Red Cross postcard from her P.O.W. son.

Medical students can still hear their teachers refer to "that interesting heart in bed 14" or "we'll have to clear out some of these old chronics" or "parents are a nuisance—all they do is upset the children."

Anyone with experience of an ordinary outpatient department will be aware of the irritation felt as ill defined or chronic cases that are regarded as "poor teaching material" present themselves. "He will recognise too, the warmth of welcome given to a case of uncomplicated classic disease, particularly if it be a little uncommon" (9).

A student may start his course with an innate sensitivity to the anxiety or distress which a patient may experience during a ward-round in which once he has been examined he is completely ignored while his condition is discussed in incomprehensible but nonetheless often anxiety-provoking terms. This sensitivity of the student will soon become dulled, even to extinction, if his teachers, the models on which his future behavior are based, consistently disregard the iatrogenic factors in the clinical situation.

A recent analysis of findings in a medical school showed that, as they progress through medical school, students "increase in the verbal expression of cynical attitudes and conscious symptoms of anxiety and decrease in the expression of humanitarian feeling. This is not true of students at comparable levels of development pursuing a career in law" (3).

*The objectives of medical student training in human relations and "patient-orientation."*—His training should keep the student alert and sensitive to the feelings of his patients and the meaning to them of their disease and its management. He needs to learn to handle patients and the factors affecting them so that all preventable deleterious effects are reduced to a minimum. Particularly must he be made aware of the possibilities and extent of physician induced or iatrogenic disturbance. He must be able to establish a relationship with patients which is of benefit to them both and which can serve as the basis for therapy and education.

There is no great virtue in teaching medical students simply what is done currently in medical practice. Educators must aim to teach what they believe should be done by the future generation they are training (2). Changes are taking place in hospitals, especially those dealing with mental and long-term disease, of which the student should be aware. Rooming-in, open visiting and the use of mothers in the care of their children in hospital have been initiated. Leaflets have been specially designed for children entering hospital and for their parents.

The student needs to understand some basic concepts, acquire certain skills, and be exposed to a variety of selected experiences.

*Some basic concepts.*—These may be considered in broad categories: first, the emotions in health and disease, then health services as a subculture, and, finally, the cultural determinants of health behavior. All these aspects are related to viewing the individual in his family and community environment.

For every patient his illness has a particular meaning and may evoke a variety of reactions, both overt and unconscious. To some patients it may be a relief, an escape, or an opportunity to wield power over others, and to other patients it is something which must be denied. It is nearly always frightening, and in addition to relief the patient also seeks explanation. He may lay blame on himself and thus regard his illness

as a punishment or he may regard himself as the victim of malevolence.

The whole atmosphere of health services is in some way a subculture possessing distinctive beliefs, behavior, and equipment shared by health personnel but not fully understood by the patient and his family. It may be a strange and frightening world which needs to be interpreted (7).

In each culture there are accepted patterns of behavior in the prevention, diagnosis, and treatment of disease. These patterns will influence the expectations the individual will have of medical personnel and procedures and the use he will make of curative and preventive services. Where the cultural background of health personnel is different from that of their patients, it is important that this be realized. What is self-evident and desirable to one may be menacing, abhorrent and incomprehensible to the other. "What seems natural in one social milieu often appears unnatural in another. A physician trained in one culture may experience confusion when he first faces a patient in another cultural setting; the patient, for his part, is frequently misled when the behavior of the alien physician diverges from his own expectations" (10).

*Some necessary skills.*—The student must acquire the skill of eliciting the patient's anxieties and misconceptions. He needs to appreciate the difference between an interrogation and an interview. To be sufficiently motivated to acquire these interview skills, he must be convinced by demonstration of the diagnostic and therapeutic importance of allowing and assisting the patient to express his fears. By verbal and non-verbal means he can indicate to the patient that these fears will neither be ignored nor derided.

A student is patiently and meticulously trained in asking the kinds of questions which will help in the formulation of the diagnosis of a condition. With increasing "patient-orientation" he will learn to ask the kind of questions which help to reveal what the patient thinks and feels and understands about his condition, and the part that he and his family can play in its treatment.

The student must acquire the skill of communicating simply and colloquially with patients of all social classes and educational backgrounds. He can be stimulated to accept the challenge of translating complex polysyllabic terminology into clear and true language. He may come to realize that the satisfaction gained from giving a patient a new insight is no whit less than that derived from a display of impressive technological superiority.

The student can be guided to learn to identify with his patient to the extent which is necessary for establishing a good relationship on which diagnosis and therapy will be based. In some cases this may generate more anxiety in the student than he can reasonably be expected to handle, because of his personality and level of maturation. The student's tutors need to be sensitive and alert to this situation, and student health and counselling services should be available for the disturbed student to discuss his own emotional problems.

These kinds of skills are usually gained fortuitously and haphazardly. They cannot perhaps be taught as systematically as the examination of the chest or urine for example, but they should be supervised and improved to the same extent as these techniques.

*Types of student learning experiences.*—With a motivated, sensitive, and alert teaching staff there is no limit to the extent of the experiences which will contribute to the student's appreciation of the clinical significance of the human dimensions of illness.

Since the realm of physician-patient relations, by its very nature, cannot be reduced to exact formulae, didactic teaching alone may be quickly lost on the student. The student tends to identify with his clinical tutors who serve as his role-model. The importance of the physician-patient relations and communication will best be imparted to the student "when he sees the clinical teacher, whom he respects for his medical knowledge, ability and reputation, developing a communicative relationship with a patient in a

manner that leaves no doubt in his mind about the importance attached to this aspect of a physician's work" (1).

There are certain common categories of learning experience in which all students can participate. They should be able to assess the nature and the source of the anxiety which the procedure of admission to hospital has generated in patients. On the basis of their expanding knowledge of the patterns of anxieties shown by patients on admission they can build up the habit and skill of giving some little time to allaying to some extent the more urgent of these anxieties. The same principles would apply in the preparation of patients for surgery and other anxiety-provoking procedures. "To interview relatives is a subtle and exacting art (far more complicated than interviewing patients) which should be taught to every medical student as assiduously as the examination of the chest" (8).

A patient's discharge from hospital is a learning situation which is rarely fully exploited. The student can learn for example, to assess a patient's understanding of the future likely course his condition will take, the meaning of his treatment, the part he and his family will play in the prevention of relapses and in his final rehabilitation. A case does not close with the final written entry on his hospital records.

Varied experience with all age groups from infancy to old age, with all social classes and with different educational and cultural backgrounds, can contribute to the student's understanding of the human dimensions of disease. An "incognito" experience of contact with health services is in many cases a salutary revelation to students.

*Summary.*—Contemporary medical education requires increasing attention to be given to the human dimensions of illness. Personality factors of students influence their interests, learning behavior and attitudes to patients. In addition to the curriculum the learning milieu of the student contributes to his development. The objectives of medical student training in the human dimensions of illness and some basic concepts, skills, and experiences are discussed.

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# MEDICAL EDUCATION FORUM

## Editorial

### FACULTY "SEED CORN"

The concept of plentiful and healthful "seed corn" is basic to the farmer's cornucopia. No less important to medical education is the matter of faculty replacement and expansion.

American medical education has passed through three major evolutionary stages: first, and perhaps the least complicated, that of the preceptor-apprentice association, wherein every physician became a potential teacher; second, the proprietary schools with their faculties of practicing clinicians; and, third, the university-affiliated schools with their core of full-time faculty recruited from both the basic and clinical disciplines.

The faculty of the medical school of today, playing the combined role of educator, researcher, and administrator, present a versatile profile. Over 50 years ago William Osler appreciated the peculiar demands on the teacher in medicine when he stated, "The teacher's life should have three periods—study until 25, investigation until 40, profession until 60, at which age I would have him retired on double allowance."*

The research and service potential of the medical and allied professions places this personnel pool in a highly competitive market. A philosophy of education which looks to the bargain basement for faculty recruitment will in general yield a product proportional to the expenditure.

President Logan Wilson of The University of Texas in a recent article on higher education† describes this problem clearly and bluntly: "In the recent years of our greatest prosperity we have in effect been letting underpaid teachers subsidize the education of our children. This exploitation has now gone on to the point that new teachers cannot be recruited in sufficient numbers, and among those who are recruited the intellectual caliber is sometimes so inferior as to make a travesty of the complex and difficult task of fitting the oncoming generation for the world of tomorrow."

The attractions of the private practice of one's profession has been a competitive campus influence of long standing, but within recent years other off-campus activities, cloaked in pseudoacademic respectability, have arisen to tempt the educator. For example, industry, appreciating certain fundamental attractions of the academic life, in certain instances now offers the lure of periodic unrestricted research, and even university affiliation.

Although most medical educators will focus on an economic factor as a growing issue in faculty recruitment, there is reason to doubt that this is the only substantial factor involved, for an evident weakness in the maturation of faculty "seed corn" lies in the very soil of its incubation, the medical school.

* "The Fixed Period," address at Johns Hopkins University, February 22, 1905.

† "A Time for Decision and Action in American Education," one of a series of articles sponsored by the Woodrow Wilson Foundation.

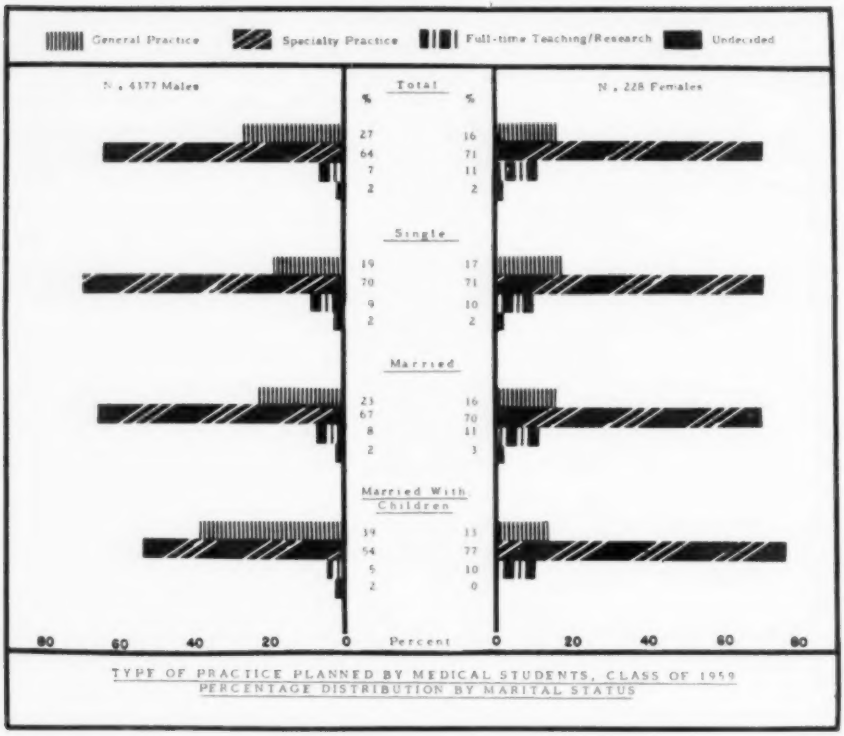
Analyze, if you will, the atmosphere of the average medical school of today in terms of potentials of faculty recruitment. Is the rigid curriculum and "lock-step" schedule conducive to interest in an academic future? Is there evidence of intelligent and active effort in the search for those students showing promise of good faculty material? What inducements or opportunities are there for a faculty prospect to step off the 4-year "conveyor belt" and mature for a period in the laboratories and libraries?

We as medical educators might desist from beating the tocsin of economic crisis long enough to set our own houses in order. The development of a favorable atmosphere for the incubation of the faculty of tomorrow is something which, in great part, is within our power to determine. We cannot afford to neglect the careful nurture of a soil conducive to the growth of good "seed corn."

MELVIN A. CASBERG, M.D.

# Datagrams*

## TYPE OF PRACTICE PLANNED




TYPE OF PRACTICE PLANNED BY MEDICAL STUDENTS, CLASS OF 1959
PERCENTAGE DISTRIBUTION BY MARITAL STATUS

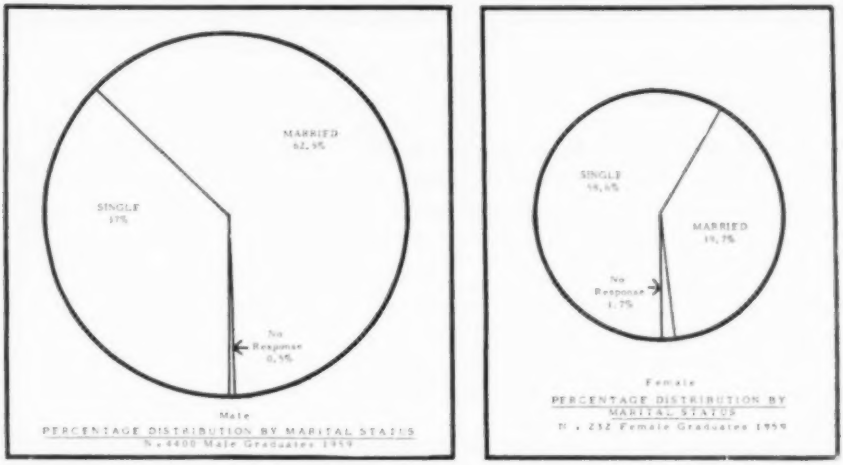
The type of practice planned by senior medical students is affected by marital status to a larger extent for males than for females. Specialty practice is planned by almost three-quarters of the single men; by about two-thirds of the married men with no children, and by little more than half of the married men who had children. This decrease by marital status in the proportion of men choosing specialty practice is accompanied by an increase in each category, respectively, in the proportion of men favoring general practice.

Marital status seems to be a less important factor with female than male students in choosing the type of practice. It is interesting to note that specialty practice is preferred by a somewhat larger proportion of women with children than by women who had no children.

NOTE: Numbers and percentages used in the current "Datagrams" are preliminary figures based on a 68 per cent return from the Student Financial Questionnaire. Final tabulations based on more complete returns may alter somewhat the figures. Information taken from the questionnaire relative to costs will require further detailed editing to eliminate items incorrectly included by students, such as the cost of a house or car, etc.

* Submitted by the Division of Operational Studies of the AAMC. Source of information will be furnished on request.

## MARITAL STATUS OF GRADUATING MEDICAL STUDENTS




Preliminary evidence, based on a questionnaire survey of the financial problems of medical students addressed to members of the graduating class of 1959, shows that the family composition of medical school graduates has changed over the last few years. To date, information has been tabulated for 4,400 male students, of whom 2,284 were married. Comparisons have been made with a survey conducted by the National Opinion Research Center on a small sample of the graduating class of 1956. This study of 1959 graduates shows 63 per cent married versus 55 per cent in the 1956 N.O.R.C. study, and of the married students 24 per cent had two or more children in contrast with 12 per cent of the earlier study. (Seven per cent of the 1959 class reported having three or more children. One graduating senior reported having seven!)

Information obtained from 232 female medical students in the class of 1959 shows that 58 per cent were single and 40 per cent were married. Thirty-three per cent of the married women had one or more children.

## TOTAL AVERAGE COSTS FOR FOUR YEARS OF MEDICAL SCHOOL AND STUDENT INDEBTEDNESS

The total average expenses, according to family composition, for four years in medical school were tabulated for 4,277 male members of the graduating class of 1959. Assuming that expenses were evenly distributed for each of the four years, the total costs per year would be: $2,376 for a single student; $2,763 for a married student; $3,210 for a married student with 1 child; and $3,925 per year for a married student having two or more children.

A sample study of medical student financial considerations in 1953 by Counts & Stalnaker indicated that about one-third of the medical students expected to be in debt at graduation and 3 per cent expected to be in debt more than $10,000. The preliminary figures for the 1959 graduating class show that 52 per cent are actually in debt and 6.5 per cent are in debt by more than $10,000.

# Address

## SOME VIEWS UPON THE NATURE OF THE RELATIONSHIP BETWEEN MIND AND BRAIN*

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Some years ago in a Hughlings Jackson lecture, I ventured to give some personal views upon the nature of the relationship of mind to brain. I said nothing original, yet something rather different from what we are accustomed to hear in those popular symposia on the brain-mind relationship, or upon brain mechanisms and consciousness, of which we have had a number of examples in recent years.

The views I expressed had the sanction of philosophers from Aristotle to Aquinas, and, in a measure, of such physiological geniuses as Hughlings Jackson and Sherrington, but there is little interest in them at the present time in a scientific world still intensely preoccupied with the concepts of cybernetics and biophysics: preoccupied in the sense that some scientists find they cannot easily entertain any concepts which transcend these fragmentary ideas.

How we approach this problem depends largely upon our concept of nature and of natural science. Therefore, I define natural science as being "the study of nature as perceived: a study wherein nature is disclosed as a complex of entities whose mutual relations can be thought of and discussed without reference to sense awareness or thought about it." This is to say that we can be perfectly good natural scientists without bothering our heads about the nature of perceiving, or the theory of knowledge—epistemology, as it is called.

This is a complex definition, which I have taken from a great mathematician and philosopher, Alfred North Whitehead (12), for some years professor of philosophy in Harvard. Its full import will appear later, but in the meantime I wish to point out that nature, that is, the world as perceived, does not comprehend all that the human mind can entertain. Science is but one universe of discourse, and he would be a bold man who maintained that there is no other possible universe of discourse about man than that of natural science. I say "a bold man"; perhaps I should have said a foolish one.

Yet, for many scientists, their scientific knowledge is almost wholly confined to what may be observed in circumstances so out of the ordinary that they do not happen in the natural course of events: to take a familiar example, the punctate electrical stimulation of the surface of the cerebral cortex, a form of procedure grossly unphysiological and therefore biologically irrelevant, as von Frey pointed out many years ago.

These scientists use carefully constructed instruments and apparatus, laboratories strictly protected from outside influences, and workers trained by complex and special methods before anything can be observed that they are willing to accept as revealing the irrevocable

* Being an Address given in the University of Cincinnati College of Medicine, April, 1959.

causal laws of nature. Anything that makes ordinary natural occurrences differ from laboratory events must be cleared out of the way, and ignored as though it did not exist. The "clearing out" is valid enough, but the total ignoring of what has been put in the discard not rarely vitiates the conclusions drawn as a result of this "cooking" of the sum of the facts, and constitutes that common vice of the intellect, the misuse of abstraction.

Surely, when we have banished from our thoughts everything outside a scientific laboratory, what a mutilated and poverty-stricken universe there remains for our contemplation. Is it not surprising, then, that we should find distinguished scientists who really believe that there is nothing in the mind and intellect of man that cannot be described in terms of, and as being no more than the expression of, the activities of neurones: in short, in terms of the sodium-potassium pump, or the bloodless dance of action potentials?

For them, as I have said before, the sonnets of Shakespeare, the *Primavera* of Botticelli, and the untold goodness and heroism of unknown thousands of human souls, are no more than the fruit of reverberating circuits and feed-back mechanisms in the brain. I am not joining these self-confessed robots in their chill and ephemeral paradise.

Of course, not all scientists live out their lives in blinkers like this, but it seems to me that those who tend to monopolize the literature on the brain-mind problem, and have such an inordinate influence on the young, do have these simply-reacting neural dispositions—I must use this term for men who deny the concept of mind.

It is because I reject this outlook that I ask your indulgence to hear a point of view rarely put before you. I realize that to do this in a scientific institution is to put one's foolish head in a lion's den, but every point of view is entitled to an occasional ventilation.

First let me say that it is the mind of *man* I am concerned with, and not with the feeble glimmerings that the anthropoid can show or the popular and cheaper rat, whose learning processes, such as they are, we commonly and unscientifically assume to be exactly the same as our own.

Aristotle defined man as a rational animal, and the definition stands, even though there are irrational elements in man, and he is not continuously rational. Even the thought of the scientist is colored emotionally, and the notion that reason acts in an emotional vacuum is a high abstraction. Nevertheless, man is a rational animal. This rational element in man distinguishes him from all other animals, even though he share their animality.

Of a man it may be said, not only *what* he is but *who* he is—he has personality. His hallmarks are self-conscious activity, the faculty of abstract thought; that is, of forming concepts apart from their embodiment in particulars, he has conscience and a moral sense, the capacity to know and to seek perfection, and he enjoys the entertainment and communication of thought and feeling by articulate speech. Man is aware of his innate limitations and dependence; that is, he is imbued with natural religion (1).

This is why concentration upon the animal element in man to the exclusion of his rational element is illogical, unscientific, and intellectually disastrous.

Moreover, I submit, this nature peculiar to man is not amenable to analysis by the disciplines of natural science: its study belongs to philosophy and theology.

It is from these premises, which transcend the natural sciences, that I start, and it may well be that some of you have parted company from me already. At least, I beg that you may listen to me. What I have to say will be a change from the confident, reiterated and bleak pronouncements of those who believe that there is nothing in the human mind and in the soul than the biophysical activities of neurones; that to speak of mind is merely to talk

of neurophysiology in a different language, but not to talk about something else; that philosophy, which is the study of the ultimate causes of things, is a mere linguistic exercise of which the adequate textbook is the dictionary, and that it has no basis in experience considered in abstraction.

I am not presuming to discuss this problem as a theologian or as a philosopher, which I should have no right to do, but, if you will allow me, as a physiologist, seeking to discover how far my science will take me to the frontier of the mind, whether the activities which express the mind in action can be described in the language of physiology, or require the qualitatively different language and ideas of psychology, and whether the theory of knowledge, of how we know, can be adequately discussed in the language of psychology, or needs a philosophical language—which operates on a higher level of abstraction than does that of the natural sciences and psychology.

My answer is going to be that these three things: abstract or conceptual thinking, sensory experiences, and the activity of neurones—however complex the last may be—are three distinct and irreducible categories, each with its own language and concepts.

Speaking purely as a physiologist I am logically restricted to the language of physiology in which is discussed—for my present purpose—the dynamic properties of the nervous system, and these alone.

I am not *qua* physiologist, qualified to discuss human actions, or human ideas. These are the field of psychologist and philosopher. I think this standpoint is absolutely essential to clear thinking, but it is not generally held, and so we find experimental psychologists and disciples of cybernetics using what I shall call "double talk" in which conceptual thinking and sensations are described in cybernetic and biophysical metaphors; while in a single paper on, let us say, consciousness, we may find the writer using the language of anatomy, physiology, psychology and philosophy indiscriminately as though they were a single language, and a single universe of discourse was in question.

I give you a simple example from a recent monograph upon "Brain, Memory and Learning" (Ritchie Russell [8]), an excellent monograph on its clinical side, where the writer says, "The traditional reasons for separating mind from brain seem to be disappearing, and in the same way the separation of psychology from brain physiology has become somewhat artificial."

Again we read, "Consciousness is simply the occurrence of cerebral alertness."

From the first quotation, I submit that we must wholly dissent. As Hughlings Jackson said, "There is no more a physiology of the mind than there is a psychology of the brain," while the equating of consciousness with "cerebral alertness" is a pure tautology, and the sentence would mean as much or as little if we put it back to front and made it read, "cerebral alertness is simply the occurrence of consciousness."

What precisely is cerebral alertness? 'Alertness' is not a word in the grammar of physiology. Head's term, 'vigilance,' is also coming into use in the same sense. Head never defined it, and its modern users do not do so. They cannot, for it is indefinable in the language of physiology in which they seek to put it. Even worse hybrids than 'cerebral alertness' or 'spinal vigilance' are to be found unrebuked in our literature: for example, the proposition that some cell groups in the brain stem can be the 'seat of wisdom and the place of understanding.' We cease to talk sense when we confuse our categories in this fashion.

As I have said, I adhere to the Aristotelian and Thomist views of man as a compound of matter and form: that is, as the union of the corporeal and the spiritual: this union in man

differing from that in animals, in that the soul in man is able to exist apart from matter (cf. Maritain [6]). Yet I must not presume to discuss theology and philosophy, and I drop back—for the purpose of this talk—to the somewhat more negative attitude which has been propounded by those two great scientists, Hughlings Jackson and Sherrington.

In their written works, neither of these men concedes the notion of the soul as understood in the sentence I have just uttered. Indeed, by those who knew him, Jackson is said to have been an agnostic in religion, while Sherrington, at the date of his Gifford lectures (9), also denied the concept of an immortal soul—though I have my own doubts as to whether this was his final judgment in his last years.

However, this is not to the purpose, but what is germane is that both men explicitly rejected the notion that mind could be accepted as something within the realm of physiology or physics, or, as Sherrington put it, within the energy system. They thought the two irreducible. This issue, then, is not solely or inevitably one of religious belief. It was in both these men the expression of their conviction that mind could not be accounted for in terms of neural activity, even though the latter was a necessary condition of the former.

The relationship between the two is not one of identity, it is not even a symmetrical one, for while mental action involves neural action, neural action does not always involve mental activity.

Jackson adopted the doctrine of psychophysical parallelism, not as a doctrine, but as a convenient working hypothesis only, in his consideration of the nervous system. Sherrington saw nothing more strange in man considered as essentially dual than in man conceived as not dual.

Sherrington has been called a Cartesian, but this was not strictly true, for Descartes confessed to no ignorance, while Sherrington's dualism was based simply upon his inability to equate brain and mind, and his rejection, or, more probably, his unawareness, of the hylomorphism of Aristotle and Aquinas.

It took some courage for both these men, i.e., Jackson and Sherrington, openly to avow this outlook, for in Jackson's time the nineteenth century positivists with their abounding confidence in the finality of science as they knew it, and their ignorant contempt of metaphysics, were firmly in the saddle, while today the amazing developments in neurophysiology that we owe to the electronic recording techniques now available have once more filled some scientists with a naïve optimism that we are almost on the brink of identifying brain with mind.

Grey (3), for example, thinks that it is only a question of careful observation and patience before we can observe as electrical discharges the thoughts of our own brains. Electrical discharges are not thoughts, and never can be the whole explanation of thought. They are not even entitled in a strictly rational terminology to be called 'information' as they now frequently are called.

Let us, indeed, reduce the electrical discharge from the neurone to its proper place. It is no more than a single expression—revealed by a particular piece of apparatus—of the sum of the vital processes within the neurone, which, like any other living cell, has its own private life over and above its specific function as an impulse conductor. The neurone has its own metabolism, respiratory, and enzyme activities of which electronic recording tells us nothing directly. In other words, the electrical discharge just happens to be what we have been able to fish up out of the depths of the neurone's life processes, with the particular electronic net we are using, and we may not assume that there are no other fish in the sea.

It is refreshing in this climate of the cybernetic and biophysical concepts of a mind substitute, so eagerly pressed upon us by the 'angry young men' of science, to find Adrian, in his obituary of Sherrington, written for the Royal Society, commenting as follows: "I personally believe that his neo-Cartesian doctrine of the duality of mind and brain will be eventually regarded as one of his greatest conceptual achievements. Sherrington realised," Adrian continues, "that his philosophical writings had come at a time of an unfavourable climate of opinion, but, despite the misunderstandings of the critics, he continued indomitably to believe that man is both matter and spirit and that spirit is supreme."

However firm one may feel in one's own convictions upon issues such as this, which have exercised the minds of men since the dawn of history, it is still comforting to feel that one is in good company in holding them, and that in due course our angry young men may grow up to realize that they have not solved the riddle of the mind and of *how* we know, despite their batteries of equipment, their mathematics and their statistics. They may not be willing to look back upon the history of thought on this subject in times past. It would perhaps be easier for them to appreciate the difficulties of their search if they had a greater historical sense than they commonly display, and its lack may explain why some of them do not grow up. Our Peter Pans of science are always with us.

It seems to me, then, that both Jackson and Sherrington halted at the frontier between brain and mind. Insofar as they were natural scientists, concerned with nature as perceived, I think they were right to do so. This may seem an odd conclusion to those who accept that psychology and psychiatry belong to the natural sciences. Insofar as psychology deals with the physiology of the special senses it is really physiology, but insofar as it deals with human motives and actions, I believe it does not belong to natural science, but is related to historical science. I cannot fully develop this theme at the moment, but those who wish to see its exposition will find this in the work of an English historian and metaphysician, Collingwood, in his book *The Idea of History*. He presents a case that demands an answer, and I have summarized it in a Linacre Lecture in 1950.

Thus, both Sherrington and Jackson are in a class apart from those of the present time who deny the concept of mind and tell us that feedback mechanisms in the cortex can know universals: that is, are capable of conceptual thinking.

Whitehead, to whom I have already referred, in his volume of lectures entitled *Modes of Thought* (12), reminds us that "Mentality involves conceptual experience: that is, the entertainment of possibilities for ideal realisation in abstraction from physical realisation. It involves the entertainment of alternatives, and 'in this entertainment mentality reaches its highest development and becomes the entertainment of the ideal, and shows itself in several species, such as the sense of morality, the mystic sense of religion, the sense of that delicate adjustment which is beauty, the sense of necessity for mutual connexions that is understanding, and the sense of discrimination of each factor.'

All this produces the history of mankind as distinct from the narrative of animal behaviours."

Yet all this, we are now told, can be achieved by the activities of nerve nets, which can know universals and thus can take over the business of what Aristotle and Aquinas knew as the active intellect.

I cannot here go into the arguments by which these cybernetic hypotheses are illustrated. They will be found in the volume of essays entitled *Perspectives in Neuropsychiatry* (7), but I do go on to say that the arguments are vitiated because it is perfectly clear that the writers

are profoundly unfamiliar with the history of the term "universal": a long and difficult history from Greek to mediaeval times. How, indeed, should biophysicists know their Greek or scholastic philosophy, and how rash of them to have borrowed this term from a discipline not their own.

Here, again, I cannot develop this thesis, but my views upon it may be found in *Brain*, 1953, in my Hughlings Jackson Lecture.

Yet a really distinguished name of our time attaches to the notion that mind is no more than brain, and brain no more than physics and mathematics can define, namely that of Lashley, a man of great physiological insights, but no friend of the science of ultimate causes. Lashley expressed the view—speaking in the Hixon Symposium (5)—that "our common meeting ground is the faith to which we all subscribe, I believe, that the phenomena of behaviour and mind are ultimately describable in the concepts of the mathematical and physical sciences."

I see no grounds upon which I should be invited to join in this act of faith, as Lashley—perhaps with unconscious irony—calls it. My deepest intuitions tell me that physics and mathematics are singularly inadequate to subsume the human mind, and I surmise that it is not the mathematicians who hold this lofty notion of the powers of mathematics, but rather those biologists who think that an equation is an explanation.

As far as I can discover from my limited studies in comparative anatomy and animal physiology, there is no evidence that the neural processes in the brain of man differ in any qualitative fashion from those in lower animals that possess a nervous system. Are our reverberating circuits, our synaptic potentials, our feedback mechanisms in any sense different in quality from those of animals?

They are more extensive and more complex, but not different in kind. In man as in the humble squid the nerve impulse originates and goes on its way owing to the same sodium-potassium exchange, the same order of electrical activity. Yet how different are man's conceptual powers from any other creature in the animal world. Here again I turn to Whitehead (*loc. cit.*), who says, "When we come to mankind, nature seems to have burst through another of its boundaries. The conceptual entertainment of unrealized possibility becomes a major force in human mentality. The life of a human being receives its worth, its importance, from the way in which unrealized ideals shape its purposes and tinge its actions."

Thus, the most we dare claim for neuronal circuits in action is that they integrate the ceaseless and changing flux of afferent impulses from the receptive periphery, and the constant activity within what Herrick calls the neuropil: that is, the synaptic fields of the cortex and the brain stem. They cannot and they do not provide conceptual knowledge as such, nor include any appreciation of the true universal. Here no nerve networks, however complex, can serve, for we pass out of the material world in which alone they function and find ourselves in an immaterial world of ideas.

The bridge between the two necessarily implies the existence of non-material faculties capable of effecting the transformation.

Thus it is that from sheer philosophical and psychological necessity, traditional commonsense philosophy from the early Greeks to Aquinas has accepted the existence in man of an essential immaterial element, capable of such transformation and setting him above the merely animal. This element has been variously named as psyche, entelechy, anima, or soul.

They recognized that, for the soul's functioning as an essential element in the hylo-

morphic human person, it needs sense data of which the brain is no more than the collecting, integrating, and distributing mechanism.

If, then, as I submit, we cannot invoke nerve nets and their activities as able to know universals, the first property of the active intellect, then we must either abandon the quest for an account of mind that shall explain its place in man's nature, or look elsewhere for it than in the concepts of physiology, physics, or mathematics. We must abandon the assumption that the human person is nothing more than a focus for the hurrying to and fro of molecules and their constituent postulated elements, or his mind no more than a bloodless dance of action potentials.

We have seen one scientist making his act of faith that ultimately the problem of mind will find its solution in the concepts of physics and mathematics. Each of us has the inalienable right to make his own act of faith, and mine is this: that these concepts are of their nature inadequate to subsume the activities of the human mind; to think that by additional knowledge they can become so is wishful thinking; and, finally, I believe that we shall have to return to the ancient concept of the soul: as an immaterial, non-corporeal part of the human person, and yet an integral part of his nature, not just some concomitant component, but something without which he is not a human person.

I subscribe to the belief that man's mind and soul are not to be wholly interpreted in terms of nerve impulses, but that there are values in his life, religious, ethical, and esthetic, not to be comprehended in terms of action potentials. I am not ready—when I view the unceasing flux of scientific knowledge and opinion—to confine the Universe within the procrustean bed of those proximate causes, different for every generation, which seem to so many scientists all that there is to be sought.

We all know the nursery tale of Simple Simon who went fishing for whales in his mother's pail. I am happy not to find myself in the ranks of those scientific Simple Simons who believe that with better hooks, lines, and baits, pitched into the same pail, they will fish out from it the answer to the riddle of the soul and the mind. The whale isn't in the pail!

I cannot put more succinctly and clearly my own personal view of the Universe in which I have lived, and of the natural scientist's strictly limited role within it.

We live in at least two worlds, the world of the humanities and the world of science. The former cannot be reduced to the latter. Perhaps I may end by quoting from Sir Gavin de Beer a cruel parody in which we get the report of a committee of scientists from a symphony. It runs as follows:

> (1) For considerable periods the four oboe players had nothing to do. The number should be reduced and the work more evenly spread over the whole of the concert, thus eliminating peaks of activity.
>
> (2) All the twelve first violins were playing identical notes. This seems unnecessary duplication. The staff of this section should be drastically cut: if a large volume of sound is required, it could be obtained by means of electronic amplifier apparatus.
>
> (3) Much effort was absorbed in the playing of demi-semi-quavers. This seems an excessive refinement. It is recommended that all notes should be rounded up to the nearest semi-quaver. If this were done it would be possible to use trainees and lower-grade operatives more extensively.
>
> (4) There seems to be too much repetition of some musical passages. Scores should be drastically pruned. No useful purpose is served by repeating on the horns a passage which has already been handled by the strings. It is estimated that if all redundant passages were eliminated, the whole concert time of two hours could be reduced to twenty minutes and there would be no need for an interval.

I should spoil this fable if I said any more.

In conclusion, I should like to guard against a misunderstanding that my remarks may cause, and, indeed, have caused in the past when I have voiced such sentiments as you have heard from me today: namely, the erroneous conclusion that I think the study of the functions of the nervous system a useless pursuit, and that I deprecate the efforts of those scientists who so ably and so tirelessly continue to seek for a fuller understanding of these functions.

I yield to no one in my respect and admiration of good work and good workers in this field. Yet to cherish these sentiments need not allow one to forget the necessity of the use by anatomists and physiologists of a precise and appropriate terminology, or the need for consistently used and logical principles of interpretation in scientific observation.

We have the right to ask for a terminology in physiological writings that is precise and physiological, and free from admixture—witting or unwitting—of terms from two other disciplines, philosophical or psychological, as though they belonged to the grammar of physiology; free also from the easy recourse to popular terms of no precise or constant reference, used to fill up gaps in scientific knowledge and to conceal their existence.

No reader of the relevant literature would deny that these standards of scientific language do not universally obtain today. The departure from them confuses thinking and expression and leads us unwittingly to the seeking of false goals far beyond the proper scope of natural science, and to the engendering at times of an absurd intellectual pride: and by that sin fell the angels.

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# Report

In its 18-point program presented to the Council on Mental Health some time ago, the Committee on Alcoholism had as one of its objectives the promotion of teaching on alcoholism in the medical schools.

To this end, the Committee has formulated a suggested outline for the teaching of this subject in the various departments of a medical college. The points outlined are suggested as guides only toward a uniformity of approach. The details, of course, must be worked out by the departments involved so as to integrate the subject into the prevailing curriculum.

MARVIN A. BLOCK, M.D., *Chairman*

*Committee on Alcoholism*
*Council on Mental Health*
*American Medical Association*

## CURRICULUM

### ALCOHOLISM: INTEGRATION INTO MEDICAL SCHOOL CURRICULUM

*First Year:*

1. Physiology of Alcohol
   - Metabolism
   - Effect of Alcohol
2. Biochemistry of Alcohol
   - Metabolism
   - Effect of Alcohol
3. Psychiatry
   - Dynamics of Social Drinking
     - Non-alcoholic Drinking
     - Normal Behavior

*Second Year:*

1. Pharmacology
   - Action of Alcohol as a Drug
   - Action of Alcohol as an Addictive Drug
2. Pathology
   - Gross and Microscopic Demonstrations of Changes in Body Systems, Including Organ Systems and Individual Organs, Associated with Chronic Alcoholism
3. Medicine
   - Physical Diagnosis
     - History-taking and Diagnosis of Alcoholism (*must be stressed*)
     - Action of Alcohol on the Several Organ Systems of the Body
     - Neurological Signs
     - Gastrointestinal Manifestations
     - Liver Findings
     - Laboratory Procedures
       - Evaluation of Tests of Liver Function and Others
4. Psychiatry
   - Lectures and Demonstrations
   - Motivation for Treatment
   - How To Stimulate Motivation
   - Detailed Description of History of Development of Alcoholism—Course, Complications, and Treatment: Preliminary to Clinical Work in Third Year

*Third Year:*

1. Psychiatry
   - Clinical Clerkships with Alcoholic In-Patients
2. Medicine
   - Medical Treatment of Alcoholics
   - In-Patient Clerkships
   - Case Findings
   - Diagnosis of Alcoholism

Relationship with Psychiatry
Neurological Manifestations and Their Treatment

3. Preventive Medicine
   Epidemiology
   Communicability
   Education of the Public to Effect of Alcoholism on Family and Community
   Alcoholism and Marriage, Family Relationships
   Responsibility of Physicians in Treating Alcoholics
   Etiology and Human Ecology
   Multi-faceted Aspects
   Conflicts about Alcohol in Society: Drinking
   Intoxication
   Alcoholism
4. Forensic Medicine
   Management of the Non-cooperative Alcoholic as It Involves Law
5. Therapeutics
   Medical Treatment
   Psychiatric Treatment
   Use of Drugs in Treating Alcoholics
   Antabuse and Temposil
   Tranquilizers

*Fourth Year:*

1. Medicine and Psychiatry
   Clinical Experience and Treatment
   Out-Patient Clerkships

# Communication

## THE CHALLENGE OF FOREIGN MEDICAL JOURNALS

JOHN R. SAMPEY, PH.D.
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An investigator who seeks to cover the current medical literature on any subject faces a formidable language barrier. A check on more than 2,000 clinical reports on the chemotherapeutic management of leukemia and allied diseases during the last decade showed that two-thirds of the articles originated in medical centers outside the continental limits of the United States. The actual figures on the tabulations were: 696 articles from the United States and 1,492 from other countries. The ten leading languages were: French, 404 reports; English (outside U.S.), 276; German, 254; Italian, 197; Spanish, 98; Russian, 88; Scandinavian, 49; Portuguese, 30; Dutch, 29; and Czechoslovakian, 26.

Tabulations of the induction of neoplasms in animals and man during the last decade showed that 56 per cent of the 2,515 articles originated in the United States. The other leading languages were: English (from countries outside U.S.), 409; German, 202; French, 187; Scandinavian, 76; Italian, 70; Russian, 39; Japanese, 33; and Spanish, 20.

Abstract journals (*Excerpta Medica*, *Chemical Abstracts*, *Biological Abstracts*, etc.) and the abstract services of a number of U.S. medical journals are a great help in making available the material in this extensive foreign literature. However, an examination of the references cited by authors in current medical journals in this country discloses scant coverage of foreign medical reports. Even reviews of the literature seldom cite many references to material not published in English, although the cost of translating relevant material is a valid charge against the grant supporting such studies.

James B. Conant has recognized this challenge of the foreign literature in his recommendation for the study of 4 years of a modern language by all high school students interested in a scientific career. Premedical training at the college level should also emphasize more foreign language study for students preparing for research careers in the medical sciences. Thorough academic grounding in one or two foreign languages gives one the background to acquire on his own, with the aid of a grammar and dictionary,* a reading knowledge of other European languages. No more than an hour a day with the journals of one's own specialty will enable even a fair language student to secure a reading knowledge within a year. The intellectual satisfaction accompanying the skillful use of another basic tool of one's own profession is its own most lasting reward for the effort expended.

* The following bibliographies of dictionaries will guide one in the selection of the best existing works in any given foreign language: R. I. Collison; Dictionaries of Foreign Languages; a Bibliographical Guide to the General and Technical Dictionaries of the Chief Foreign Languages, with Historical and Explanatory Notes and References. New York: Hafner, 1955, 210 p.; United Nations Educational, Scientific and Cultural Organization: Bibliography of Interlingual Scientific and Technical Dictionaries. Paris: UNESCO, 1953, p. 178; U.S. Library of Congress: General Reference and Bibliography Division. Foreign language–English dictionaries. Washington, 1955. 2 vols.

# ABSTRACTS FROM THE WORLD OF MEDICAL EDUCATION

ANGELA SANCHEZ-BARBUDO, PH.D.
Abstract Editor

**Curriculi and Syllabi.** M. A. H. SIDDIQUI, M.D. Proceedings of the Tenth Pakistan Conference, Lahore, March 10–15, 1958, Part IV: Symposium on Medical Education in Pakistan, pp. 19–36.

In his speech, Dr. Siddiqui, Professor of Surgery at Dow Medical College, Karachi, reviews the history of medical education in India, and discusses, in broad lines, the general principles underlying academic medicine in today's Pakistan. Medical education in India, over a 100 years old, can be divided into two phases. The first, of colonial type, started with the establishment of the Indian Medical Service, which borrowed its educational system, curriculum and courses from the United Kingdom (the first medical college was established about a century ago in Madras and was followed by three others, in Calcutta, Bombay, and Lahore). Medical teachers also came from Britain, and the British General Medical Council regulated curriculum and syllabus, sending down inspectors to see that the colleges maintained certain standards of training. However, as the number of graduates was not sufficient for the sub-continent's health needs, soon a lower grade of training, for "Health Assistants," was started, which later developed into the so-called "L.M.S." A serious problem arose when the L.M.S. licentiates threatened to outnumber the scientifically trained real graduates of the medical colleges. In 1938, the Bradfield Committee drafted certain resolutions to remedy this situation, which culminated in the upgrading of L.M.S. institutions. As political consciousness grew in India, the trend toward educational autonomy also became stronger, and the Indian Medical Association demanded—and obtained in 1932—from the British Government the establishment of the Medical Council of India (whose first secretary, however, was imported from the U.K.). After this body came into existence, it was thought that the medical studies were not quite suited to the conditions in India, and the *Minimum Requirement Committees* were established. During the last 20 years, these committees have been working at the revision of medical education, producing the "curriculi and syllabi" of today's medical colleges. In 1943, after much "hue and cry" that there were not enough doctors, too little progress in medical relief; that medical education was too costly, admissions too scarce, etc., the Bhore Committee (under Sir Joseph Bhore) was set up. This organism appointed an important subcommittee on Basic Education, in order to satisfy the general claim for a "Basic Doctor," an unfortunate slogan, in the author's view, since it contained the idea of the "cheap doctor" modeled after the Russian type of "Feldsher." The Bhore Committee suggested a reduction of the medical course from 5 to 4 years. However, the Minimum Requirement Committee (in the labors of which Dr. Siddiqui declares himself proud to have had a share during the last two decades) decided that this was impracticable in view of the rapid growth of medical science which required an extension rather than a reduction of medical education. When the idea of *in-*

*ternship* was introduced from the U.K., after much discussion it was finally decided that 1 year of compulsory internship should be added to the *unreduced* medical 5-year course. This was the situation when the *Partition* came and Pakistan formed its own Medical Council, which adopted, however, the same medical curriculum as the Medical Council of India. Later (in 1954) a Committee was appointed which was to recommend any changes thought necessary for the adaptation of medical training to the present setup, and which, the author points out, has now reached a crucial stage when very radical reforms are being suggested. These recommendations, bearing on examinations, time-table, internship, etc., are discussed in detail by Dr. Siddiqui. In the following discussion, other members of the symposium give their opinion on the various points raised and also offer a number of suggestions which reflect the respective standpoints of the surgeon, the physiologist, the anatomist, pharmacologist, and public health officer.

**Health and History in the Middle East.** JOHN L. WILSON, M.D. New England Journal of Medicine, pp. 751–57, 811–14 (April 9 and 16), 1959.

The Middle East, with its strategic position and its wealth in oil, is occupying today a prominent position on the world stage. The comment has been made that "even the people of the Middle West are concerned about the Middle East," and rightly so, as has been shown by the 1956 Suez episode. Millions of people in this region are striving to improve their living standards and to achieve political order, while their continuous efforts have repercussions far beyond their border. Economic and health conditions are poor in the Middle East, the reasons of which can only be understood through a study of its history, economics, and culture. Therefore, after a sketch of its physical setting (in order to clarify the prevailing confusion about "Middle East," "Near East," "Arab World," "Underdeveloped Countries," etc.) and a brief review of the history of the Middle Eastern countries, from the ancient period (5000–331 B.C.) to the era of the "Arab Awakening" begun in 1918 (the process of which we are still witnessing today), Dr. Wilson feels he is in a better position to discuss objectively certain features of the contemporary Middle East which constitute the background of present-day conflicts. Concentrating on the Arab segment of Middle Eastern population (its largest group), he examines the prevailing economic and cultural conditions with the aid of abundant statistical data (on demographic trends, per capita income, literacy, infant mortality, death rate, nutritional factors, medical services and schools, etc.), with special emphasis on the health situation. As in other "underdeveloped" countries where poverty is compounded by illiteracy, health conditions are extremely poor in the Middle East: infant mortality and crude death rates are high, primarily due to unhygienic living and inadequate health services. Parasitic and infectious diseases are rampant and account for most of the morbidity and mortality. Although there is no famine, the food supply is badly distributed, and many people can be quickly reduced to the starvation level by bad harvests, economic recession, or political upheavals. There is in the Middle Eastern countries (with the exception of Israel) a very marked shortage of physicians and of hospital facilities, intensified by gross maldistribution and deficiencies in medical training and orientation. It is pointed out that medical progress in the Middle East, because of its complex interrelations, is not simply a matter of applying scientific medical principles and techniques, but depends largely on a social and economic revival. Two institutions will be of the greatest importance in improving the health situation: the governments and the medical schools. In the Middle East, public welfare is now slowly emerging as a primary responsibility of governments, including the concept of health as a fundamental right of the people, and some countries have been developing a series of health programs (especially Iraq and Egypt). However, the government con-

tributions require an enlightened and stable political system which has not yet evolved in most Middle Eastern countries, and health progress is delayed in consequence. As to the medical schools, the few existing ones are understaffed and inadequately equipped. Since they constitute the ultimate source of the men and ideas needed to cope with the problem of health, their strengthening must be the focus of thoughtful attention in the future. Full-time faculties and a clarification of the objectives of medical education are suggested as the most efficient means to spread the benefits of medical science promptly and fairly through the Middle Eastern communities, in order to improve the state of health in that region.

**The Physician in the Federal Republic in the Year 1957.** DR. JOSEF STOCKHAUSEN. World Medical Journal, Vol. **6,** No. 2, pp. 111–12; p. 117 (March), 1959.

Dr. Stockhausen, Secretary General of the *Bundesärztekammer* (German Federal Medical Council) offers a brief report on medical practice, organization, and education in Germany today. Practice of medicine and use of the title of physician in the Federal Republic are subject to approval by the competent German authorities. According to the Medical Appointment Ordinance of 1933 (still in force), licensure is granted to a person who, after graduating from a secondary school, has completed 7½ years of medical training (5½ of these are detailed for university studies, at the end of which the State Medical Examination has to be passed, followed by 2 years of practical medical training as medical assistant). A statistical survey shows that at the beginning of 1957 a total of 71,833 physicians were registered within the territory of the Federal Republic: 42,943 (among them 6,035 women) were in private practice (6,987 were simultaneously active as "Belegärzte," that is, hospital consultants); 22,590 physicians held hospital staff appointments (including medical assistants); 5,354 occupied full-time administrative and research positions or acted as medical officers in public health services, scientific organizations, or industry; 3,520 physicians were no longer active professionally. In April, 1956, there was a total of 220 male and 74 female physicians unemployed. Since 1938, and especially since the war, the medical coverage for the Federal Republic is showing a steady increase (in 1938, there were 7.3 doctors/10,000 inhabitants, while in 1957 the rate had almost doubled to 14.3). The percentage of specialists in proportion to the total of practicing doctors has also risen (from 31.3 per cent in 1938 to 35.5 per cent in 1957), and at present sixteen different specialties are practiced by qualified physicians. As to the ethical and scientific aspects governing the professional activities of German doctors within the Federal Republic, the law states expressly that the practice of medicine is not a *trade* but a *profession*, exercised in an independent, free capacity. The majority of physicians are active in private practice, and the medical care of the population (except hospital patients) is mainly in their hands. However, the medical corps is subject to a professional code specifically drawn up by its representative body, the Medical Association (based on the classic principles of the Hippocratic Oath), and any infringement of professional ethics is dealt with in professional courts. Postgraduate medical education is carried out by medical societies (*Ärztekammern*) through special local or regional courses, lectures, and demonstrations, while the *Bundesärztekammer* (German Medical Association) provides similar facilities nationally and internationally; postgraduate courses are also organized by specialized associations, universities, and academies. As to the physician's status within German post-war society, it is pointed out that, the medical profession being now as in all times held in high esteem in Germany, the physician's economic situation compares unfavorably with his social and scientific standing. The statutory remuneration rates and total returns made by health insurance companies, trailing behind each new development in the buying power of German currency, adversely affect the physicians income. Lead-

ing physicians in charge of hospitals—once quite "well off"—are now facing increasing difficulties, due mainly to the serious overcrowding of the medical profession which has a steadily worsening influence on the terms of individual contracts. The situation of the newly qualified physicians and assistant doctors (the latter are unpaid) is also adversely affected by overcrowding. The pursuit of a medical career in Germany is further endangered, according to the author, by a "growing tendency toward the welfare state," although the medical profession is "solidly and firmly opposing any such tendencies." All German physicians are members of medical associations (statutory corporations) within the various states of the Federal Republic. The Medical Associations (their delegates are elected for a certain period by all the physicians of each state) exercise full control and supervision over all general and specialized professional activities (they also issue Certificates of Specialization). On a federal level, all medical associations established by state law are represented by the Federal Medical Council (*Arbeitsgemeinschaft der Westdeutschen Ärztekammern*); their General Meeting is known as *Der Deutsche Ärztetag*." The total labor force and most other employees are compelled by law to join the Social Health Insurance Scheme. Panel doctors (*Kassenärzte*), appointed by the various health insurance organizations, are in charge of outpatient treatment. They are organized in Panel Doctor Associations (statutory corporations) for each state of the Federal Republic, which states in turn are jointly represented by the *Kassenärztliche Bundesvereinigung*, which looks after the interest of panel doctors in their dealings with health insurance companies and supervises the professional activities and duties of panel doctors (in return for all the services rendered, the health insurance organizations settle with the Panel Doctors Associations by overall payments, passed on to the individual members according to a scheme for the distribution of fees devised by self-governing bodies). The Panel Doctors Associations are also responsible for setting up, together with the health insurance companies, boards of appointment controlling the admission of physicians to authorized Panel Doctor Associations. The number of panel doctors is limited by law (in general, one physician should be available for every 500 social and health insurance subscribers, who have free choice among all authorized panel doctors).

**The Reorganization of French Medicine.** J. F. DELAFRESNAYE, M.D. (Paris), The Lancet, Vol. 1, pp. 776–77 (April 11), 1959 (London).

The Decree *Debré*, of Dec. 3, 1958 (issued under the full powers granted by Parliament to the government of General de Gaulle), contains the first major reform of French medicine since the early 19th century. Its two fundamental pillars are the revision of the curriculum and the creation of university hospital centers (*centres hospitaliers et universitaires*), to fuse the hitherto separate university and hospital careers, establish hospital practice and research on a full-time basis, and expand research facilities and opportunities. At present, medical studies last 7 years (the premedical year is done at the Faculty of Science), and from the moment the student enters the Faculty of Medicine, he leads a double life: In the morning he attends clinical courses at the hospital, and in the afternoon lectures and practical courses at the university. The first 2 years of the university course are devoted to fundamental sciences; the third to pathology; the fourth, fifth, and sixth to clinical surgery, the specialties, psychiatry, public health and therapeutics. Each year the student must take examinations on the subject taught during the year. At the end of studies, he takes his "clinical" and must write a M.D. thesis. At the hospital, he attends lectures in pathology, clinical medicine, and surgery, but there is no coordination between university and hospital lectures. His hospital training is completed by ward rounds, clinical demonstrations, and attendance at opera-

tions. There are few opportunities for him to come close to patients and to assume any responsibility for their care. The duality in medical studies continues after qualification, and those who want both an academic and a hospital career must take two sets of highly competitive examinations. Although no final decision has been taken yet, the revised curriculum will very likely be divided into three "cycles": The first (2 or 3 years) will be devoted exclusively to the basic sciences and clinical signs (no hospital work); the second (3 years) will be held in the new university hospital centers where all students will have to perform the duties of today's *externes*, while this title will be reserved for those who get the highest grades at their university examinations (in the present system, an *externe* is intrusted with the care of patients and receives a small salary; *external* and *internat* are competitive examinations held by the hospital boards, the standards of which are so high that actually only one student in five becomes an *externe* and one in twenty an *interne*—the latter holding a position equivalent to that of a "house-physician," only with more responsibilities, and also on a salary basis). The third cycle, leading to a doctorate in biological sciences, is aimed at the training of research workers and is expected to be arranged in collaboration with the Faculty of Science. The *internat* will remain as it is today and will continue to be the gate of entree for clinical careers. As to the second fundamental reform provided by the 1958 decree, the fusion of hospital and university careers has become very necessary because of the prevailing serious shortage of medical instructors. There are today many more highly trained hospital physicians and specialists (who have no teaching duties) than university lecturers and professors in the clinical disciplines. Therefore, it has been decided that hospital physicians will all have teaching duties and that the fundamental scientists will be given routine duties in the new hospital centers (a certain number of hospitals will be transformed into university hospital centers by the addition of lecture rooms, labs, libraries, etc.). These measures should not only increase the number of clinical teachers but also open up the hospitals to the fundamental sciences. The teaching staff, whether clinical or basic, will be recruited on a national basis in order to enable exchanges between the universities, and all will work on a full-time basis (this innovation created the greatest controversy, now settled). The broad lines of the reform are clear, but many details remain to be filled in, and, since the French system does not permit various experimental methods to be introduced in different universities, the responsibility placed on the planning committees is great. The change-over will be gradual, but within 10 years the reform which will change the face of French medical education must be established as a fact. (For more details on the provisions of the 1958 decree on French medicine, and the new medical posts it has established, see also *Education in France*, No. 6, May, 1959, pp. 12–20.)

**The Status of Pharmacology as a Science.** CHAUNCEY D. LEAKE. American Journal of Pharmaceutical Education, Vol. **23**, pp. 173–96 (Spring), 1959.

What is the status of pharmacology as a science? What are its peculiar and characteristic features that distinguish it from other sciences? What is the extent of applications of pharmacological knowledge, and what are the theoretical concepts on which pharmacology rests? These, according to the author, are the most important questions which, in the current explosion of pharmacological interest and experimentation, it might be wise to consider. Pharmacology, he states, is a "remarkable scientific discipline." It is the study of the action of chemical agents on living material—plant or animal—which brings together all the complex theories and data acquired in chemistry and biology. As a science, pharmacology rose in the XIXth century together with other aspects of functional biology. Biological thinking was then profoundly influenced by Dar-

win's, Schwann's, and Virchow's theories. In an atmosphere of significant biological advance, and by focusing attention on the immediate practical consequences of studying the action of chemicals on man, pharmacology grew rapidly through the extension of a vast number of empirical observations, as obtained from animal experimentation and from clinical study. However, it was not until the beginning of this century that sufficient advance had been made to undertake a systematic screening of various related chemicals, and significant theoretical concepts for pharmacology were not formulated until the last few decades. The following four specific problems—chemical and biological in nature—define the scope of pharmacology, differentiating it from other sciences: (1) dose-effect and time-concentration relations; (2) mechanisms of absorption, distribution, fate and metabolism, and excretion of chemicals in living material; (3) the mechanisms of actions of chemicals on living material; and (4), one of the most intriguing scientific problems, the relations between chemical constitution and structure and biological action (all these problems are discussed in detail). A rapidly growing science, pharmacology has broad interrelations with many other biological sciences. Current pharmacological studies are, for instance, adding much excitement to the explorations of the functioning of the brain and its disturbances and the whole field of neuropharmacology has blossomed greatly as a consequence (besides a vast number of "tranquilizers" it is now possible to develop numerous "energizers"). In addition to finding application in many other forms of biological science, pharmacology has direct applications in numerous aspects of professional work, most obviously in medicine, and in connection with the use of drugs. An extremely broad field of application is also developing in veterinary medicine, as well as in agriculture, and even in chemical warfare. The ever-broadening field of pharmacological applications has raised questions as to the ethical use of drugs under various circumstances and conditions, involving also, in many instances, legal matters. Summing up, it can be said that pharmacology is a broad and rapidly growing field, with specific scientific problems, involving various aspects of chemistry and biology. It has thus become a "bridging science" which requires an extensive scientific background for its effective cultivation. Pharmacological knowledge, vastly increased since the past century, finds currently applications in multiple fields, from medicine to warfare and sociology. As an *addendum*, the author offers an extensive list "toward a critical bibliography of pharmacology."

**The Study of the History of Medicine.** OWSEI TEMKIN. Bulletin of the Johns Hopkins Hospital, No. 3, pp. 99–106 (March), 1959.

Since much has already been written and said about the *teaching* of medical history (now a required subject at Johns Hopkins), the author (of the Johns Hopkins' Institute of the History of Medicine) prefers to discuss instead the *study* of this discipline. The central question he raises is: In what spirit and where should medical history be studied? Of all the many potential students (including the novelist, playwright, or even the producer of historical films) this paper is only concerned with the two categories needing a deeper understanding of the development of medical conditions and science: the historian interested in medicine, and the physician interested in history. As to the first, it turns out that often a profound knowledge of the period he deals with is more important than a technical knowledge of medicine (as outstanding examples of the successful approach by the general historian, Dr. Edelstein's work on Hippocratic medicine and Professor Shryock's *Development of Modern Medicine* are cited). However, this does not mean that the historian should only be concerned with the social, economic, or intellectual background of medicine: the medical and scientific content, no less than the social and cultural en-

vironment, belongs definitely in the realm of the historian's investigation. The problem is: How can a historian who makes medicine the object of his study combine knowledge of general history with knowledge of medicine? If the solutions offered formerly and those offered now are compared, we find that medical history until 30 years ago was indisputedly in the hands of medically trained persons and considered just another medical specialty. Besides, a knowledge of classical and of some modern European languages was required, as well as acquaintance with such historical methods as needed. Although the results were not altogether satisfactory (often mistakes were made which a first-year history student could have avoided easily), a medical historian in the past was able to understand—and to teach, if necessary—the history of medicine as a whole, of all times and in all its aspects. Today, this relatively simple scheme has been upset by several factors, such as, in this country, the decline of the study of foreign languages, and an increasing inability to enter into the spirit of a civilization fundamentally different from ours. Furthermore, historical studies themselves have become more and more complex, extending far outside their traditional field. Gradually, the serious study of medical history is being transferred to the general historian, who, however, is not prepared to deal with medicine of all times. A division of labor has been suggested: "Let the historian look after the social and cultural development of medicine and let the medical man study the technical developments." This solution, however, reminds the author of Solomon's judgment, in as much as he believes it would lead "to the death of the child." Thus the dilemma persists: On the one side, medical history as studied by the historian with its ever increasing demands upon historical knowledge, accompanied by the ever decreasing mastery of historical tools on the part of medical men. On the other, the vital interest of the physician and scientist searching that which the historian is not necessarily willing or able to produce: a link between the past, the present, and the future of medicine. The solution of this dilemma, the author thinks, will not be found in either of the two extremes. It is a fact that medicine is no longer the exclusive domain of doctors of medicine. The licensed practitioner is now on the way to becoming a "specialist" within the wider structure of medicine: he is the one who is in direct contact with the patients, while an army of other specialists—mostly Doctors of Philosophy or Science—work in laboratories, libraries and Public Health agencies. The changing character of medicine will increase and fortify the demand for historical research and analysis, and, while it is not likely that the historian concerned only with a knowledge of the past will be able to evaluate what was done formerly in relation to what is being done today (especially where questions of medical science and practice are concerned), it appears equally doubtful that "we can go back to the time of Osler and keep historical studies a mere adjunct of the physiologist, internist, or surgeon." Although both approaches have their right to existence, both can lead to valuable results, and both should be cultivated; beyond either of them there should be an "organic synthesis," the history of medicine per se. Such a discipline justifies the existence of independent departments of the history of medicine, and the Institute of the History of Medicine at Johns Hopkins provides an excellent model of such an organization: situated in a great medical library, it has excellent material facilities; it is linked with a Department of Philosophy with a strong humanistic orientation, and it is part of a medical school famous throughout the world.

**Television in Otolaryngology and Other Specialties—A New Teaching Device.** PAUL MOORE, PH.D., and HANS VON LEDEN, M.D. The Journal of the American Medical Association, pp. 1976–80 (April 25), 1959.

Clinical teaching in otorhinolaryngology and other surgical specialties has been hampered by the inability of the examiner to expose the cavities of ears, nose, and throat for simultaneous inspection by others. The two techniques currently employed to remedy this serious handicap to clinical, classroom, and surgical instruction have been helpful in certain instances but have not satisfied the primary need. One of these procedures uses a small mirror near the viewing axis of the examiner which reflects the critical image to a second observer; the other is photography, including both still and motion pictures. The first method permits an immediate display of the clinical material, but observation is sometimes difficult and is limited to one additional observer at a time; whereas photography displays the material to many observers, but the immediacy of the clinical presentation is lacking. To achieve both these objectives three conditions are required: (1) The examiner must be able to see the field clearly; (2) the equipment must conform to his movements; and (3) all the other observers must be able to visualize the same area as the instructor. The basic problem seems to be solved now through closed-circuit T.V. The equipment, which meets all three requirements—a small T.V. camera and an associated special periscopic lens system—permits direct viewing by an examiner and simultaneous televiewing of exactly the same subject area by any number of observers. A complete working pilot model was built and used in several teaching situations in otorhinolaryngology, and its practicability has been demonstrated. A few desirable modifications are being developed now. The device and its functioning are described in detail in this paper (with various pictorial illustrations), and it is pointed out that, with appropriate changes in the optical system, the same principle could be applied successfully to televise similar procedures in various other branches of medicine and surgery.

**University Education in America.** T. ANDREW QUILLAM. The Universities Review, Vol. **31,** No. 2 (Feb.), 1959.

Despite traditional links and some superficial resemblances, the educational systems of Great Britain and the United States do not bear too close a comparison, because the aims of the two countries are basically as dissimilar as their history and geographical environments. There is, however, on both sides of the Atlantic, a growing awareness of the flaws of a too nationalistic approach to popular education, and it is to be hoped that the transatlantic exchange programs for staff members and students will be broadened and increased as one of the best ways to blend together and improve both systems. The present discussion of university education in America is based on the impressions gained by the author (a lecturer in the Department of Anatomy at London's University College) during a session (1954–55) spent at the University of Minnesota; another (1955–56) at the University of California at Los Angeles, and from visits with staff members of universities of all types all over the U.S. and Canada. It is pointed out that the American educational system, although its roots go back to the past, has been shaped quite recently. It developed out of the country's pressing need to weld its widely dispersed, heterogeneous and rapidly increasing population into a stable and technically capable national unit. Today, the second- and third-generation offspring of earlier immigrants has grown up: already entirely adapted to the American standards of behavior and ideals, many of them are now beginning to realize that neither their personal vocational horizons nor the vital interests of their country are confined any longer to their continent. In a certain way, this awareness is reflected in the trend, increasingly noticeable among university circles, toward shifting the stress of higher education from utilitarian, technicological matters to humanistic fundamentals. On the

other hand, the rapid technological progress of the last 20 years has created completely new skills, and training in these fields, in view of the international race for supremacy, may be of vital importance for national survival. It is the interplay of these two factors which, according to the author, will soon determine future educational trends. But it remains to be seen, he thinks, whether the challenge can be met by "evolutional change" or whether it will prove more expedient to create new institutions to meet the urgent problems of an ever-changing situation. After having made these background observations, Dr. Quillam describes in detail the organization and functioning of American universities, emphasizing the differences between the British and American institutions and commenting on underlying concepts.

# NEW BOOKS

KENNETH E. PENROD, M.D.
Book Review Editor

## Abstracts

**Cole and Elman's Textbook of Surgery.** By WARREN H. COLE. With 49 Contributing Authors and Consultants. 7th ed. New York: Appleton-Century-Crofts, Inc., 1959. 1197 pp. 1,000 illustrations. $17.00.

Since publication of the last edition of this book Dr. Elman has died. However, he contributed much to this revision, and Dr. Cole has attempted to carry on the traditions of the previous editions. Much material has been completely rewritten, and considerable revision has taken place. Nine new chapters and 297 new figures have been added. A chapter dealing with laboratory tests and aids has been added. A chapter on the systemic reaction to trauma has been added, a new section has been written on cancer, and two new chapters on the heart and great vessels have been included. Physiology has been stressed, and the needs of the student have been continually kept in mind. Nonsurgical treatment has been described in detail, and the principles of operating treatment are presented. Numerous illustrations of gross specimens and photomicrographs will be found throughout the text.

**Principles of Pathology.** By HOWARD C. HOPPS. New York: Appleton-Century-Crofts, Inc., 1959. 295 pp., 613 illustrations. $6.95.

This book is written primarily for the student. It is intended to give him a concept of disease and an understanding of the processes of disease—how disease becomes established, how it produces its effects, and insofar as possible, why. It attempts to bridge that difficult gap between the preclinical and clinical. For students ancillary to medicine, it is intended that the book provide essential background as to the nature of disease and its processes. This book is primarily concerned with disease per se, not a particular technique of study. Etiology and pathogenesis of disease, as well as the effect of disease upon the body, are stressed. The book is organized around the author's conviction that effective teaching begins with relatively simple concepts, building from these to the more complex ones.

**Respiratory Physiology and Its Clinical Application.** By JOHN H. KNOWLES. Cambridge: Harvard University Press, 1959. 212 pp. $5.25.

This book is intended for the medical student and practicing physician. An attempt has been made to assemble and interpret, in an applied and clinical frame of reference, pertinent material concerning respiratory physiology in normal and diseased states. Those tests have been emphasized which can be carried out by the practicing physician with a general hospital laboratory and a small amount of equipment available to him. Other more complicated tests are discussed briefly and pertinent references cited for further reading. Pathologic physiology is stressed, and signs and symptoms related wherever possible to the results of specific pulmonary function tests. Symbols and mathematical exercises have been kept to a minimum and the concepts they embody discussed in words. In short, this book is written for the interested clinician with the hope that some of the trepidation and skepticism surrounding respiratory physiology and pulmonary function tests will be dispelled and the pathologic physiology of chronic pulmonary disease more easily understood.

**Atlas of Roentgenographic Measurement.** By LEE B. LUSTED and THEODORE E. KEATS. Chicago: The Year Book Publishers, Inc., 1959. 171 pp. $9.00.

Heretofore the large volume of roentgenographic measurements of internal anatomic

structures in living subjects has been widely scattered throughout the literature. This Atlas represents an effort to bring together in one working source for the practicing physician the measurements considered reliable. The authors readily acknowledge the fact that their accumulation is not all-inclusive but rather selective in the interest of reliability and practicality. In those areas where relatively scant data are available this is pointed out both as a caution in interpretation and as an area needing further study.

**Intern's Manual.** By ARTHUR BERNSTEIN. 2d ed. Chicago: The Year Book Publishers, Inc., 1959. 294 pp. $3.00.

The material in this edition has been brought up to date. Some material has been added to make the manual more useful. The alphabetical arrangement has been retained, but an index has also been included. Cross references have been retained as an adjunct to the alphabetical listings.

**An Experimental Inquiry into the Principles of Nutrition and the Digestive Process.** By JOHN R. YOUNG. Urbana: University of Illinois Press, 1959. 48 pp. $2.50.

This reproduction of an historical classic has been made under the sponsorship of the University of Illinois History of Science Society. The first portion is written by Dr. William C. Rose, entitled "John R. Young, First American Biochemist." Dr. Young submitted a remarkable thesis to the Medical Faculty, Provost, and Trustees of the University of Pennsylvania in fulfillment of the requirements for the degree of Doctor of Medicine on June 8, 1803. This document, as Dr. Rose points out, represented an extraordinary contribution to medical science of that day. It received a very limited audience, and few copies were made. The thesis is reproduced here for the first time. Copies of the first printing, and the reprint of 1805, are extremely rare and few have been aware of this dissertation or have read it.

**J.-M. Charcot: His Life—His Work.** By GEORGES GUILLAIN. Edited and translated by Pearce Bailey. New York: Paul B. Hoeber, Inc., 1959. 188 pp. $7.00.

Dr. Jean-Martin Charcot (1825–1893) occupied the world's first professorial chair in clinical neurology at the faculty of medicine in Paris. Prior to this book, no biography has yet appeared concerning this famous French physician. This book is divided into two parts, devoted to Charcot's life and to his scientific work. It will be of much interest to anyone interested in clinical neurology or medical history.

**Practitioners' Conferences Held at New York Hospital—Cornell Medical Center.** Edited by WILLIAM J. GRACE. Vol. 7. New York: Appleton-Century-Crofts, Inc., 1959. 271 pp. $6.75.

This is the last volume in the series devoted to postgraduate education at New York Hospital—Cornell Medical Center. Modern treatment and latest management methods are presented by authorities, with discussion from the floor included. In this volume thirteen conferences are contained. In addition a subject index for all seven volumes is included at the end.

**An Introduction to Public Health.** By HARRY S. MUSTARD and ERNEST L. STEBBINS. 4th ed. New York: The Macmillan Company, 1959. 313 pp. $4.50.

This volume, in its original conception, was designed mainly to orient the student in the field of public health. It furnishes a background of information and, in one way or another, tends to develop a philosophy and perspective. It is purposely brief and does not concern itself with details of public health administration; nor does it presume to offer suggestions for classroom or field instruction in any of the specialized phases of public health practice. It therefore provides information rather than direction. In the 6½ years since the 3d edition of this book major changes have taken place in public health organization in the United States and the world. The book has been thoroughly brought up to date in the light of these newer developments.

**Diabetic Manual.** By ELLIOTT P. JOSLIN. 10th ed. Philadelphia: Lea and Febiger, 1959. 296 pp. $3.75.

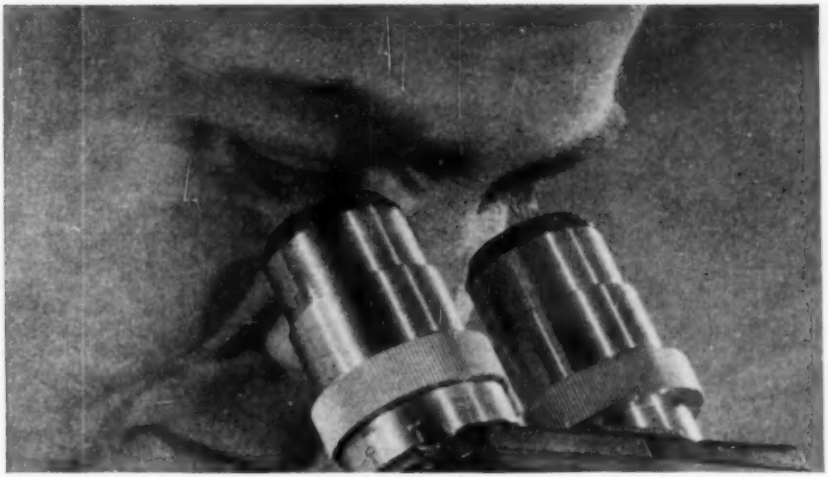
This book, written for the diabetic patient, is the 10th edition in a series begun 41 years ago by the most distinguished physician in the field of diabetes. The present volume contains a Red Cross card for diabetics stating "I am a diabetic" as well as a small billfold-size food chart for diabetics.

**Neuropharmacology.** Trans. Fourth Josiah Macy, Jr., Conference, September 25, 26, 27, 1957. Edited by HAROLD A. ABRAMSON. New York: The Josiah Macy, Jr. Foundation, 1959. 268 pp. $5.00.

The subjects covered in this conference were "The Effect of Respiratory Poisons and Anoxia on Siamese Fighting Fish in Relation to LSD-25 Reaction," "Clinical Studies with Taraxein," "Stop and Start Systems," and "Some Relations Between Chemical Structure and Physiologic Action of Mescaline and Related Compounds."

**Physiology of Prematurity.** Trans. Third Josiah Macy, Jr., Conference, March 25, 26, 27, 1958. Edited by JONATHAN T. LANMAN. New York: The Josiah Macy, Jr. Foundation, 1958. 145 pages. $3.00.

The subjects covered in this conference were "Metabolic and Enzymic Changes During Development," "Bile Pigment Metabolism and Liver Function in Premature Infants," "Studies on Congenitally Jaundiced Rats," "Experience with Glucuronic Acid in Treatment of Bilirubinemia," and "Biochemical Mechanisms in Glucuronide Formation."



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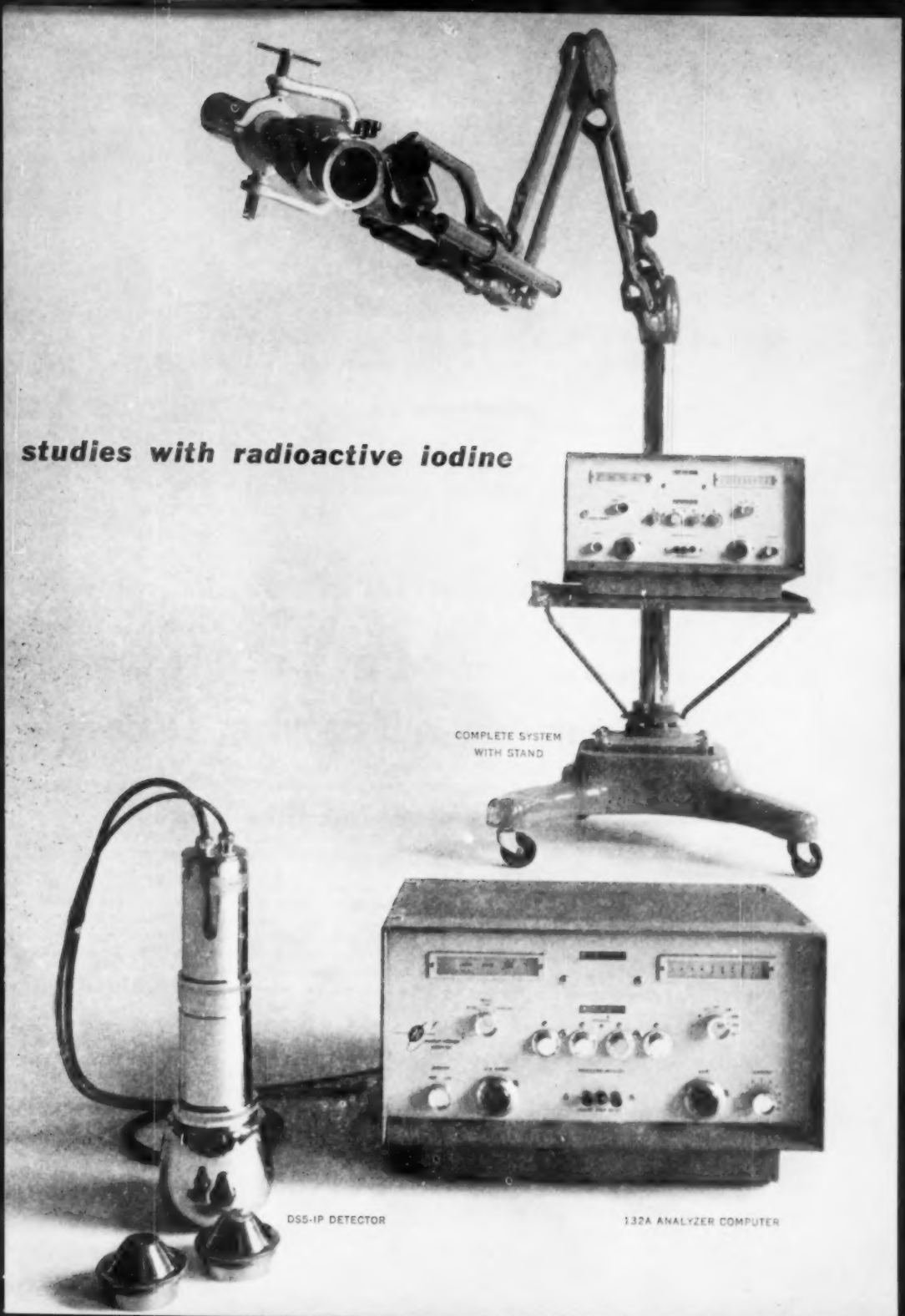
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Extracorporeal circulation is a bold idea. And it bids to become one of surgery's most effective new developments.

In open heart surgery, particularly, its advantages are dramatically seen. The surgeon no longer need work blind on the heart. Now he shunts the blood stream from the vena cavae into a heart-lung machine, by-passing the heart completely. The machine takes over pumping and oxygenating of blood. The surgeon can operate directly on the visible heart, in a comparatively bloodless field.

As would be expected, extracorporeal procedures pose certain problems. One of the more difficult of these has had to do with coagulability of blood.

Untreated blood will coagulate when perfused through pump and oxygenator. This characteristic can be counteracted by adding heparin to the blood stream. But at operation's end, the surgeon must promptly restore the blood's normal clotting mechanism. And this has proved a troublesome problem.

An improved heparin antagonist has been needed. It must neutralize heparin rapidly. It should not be prone to hypotensive effects. It must not be destroyed in the blood stream sooner than heparin, lest there be a rebound of heparin effect; if rebound occurs, the patient's bleeding tendency will abruptly return, and uncontrollable hemorrhage has sometimes resulted. Dosage levels should be easily determined.

Such a heparin antagonist has now been introduced by Abbott. This new antagonist, Polybrene,* (Hexadimethrine Bromide, Abbott), is now being released for general use.

Polybrene seems to avoid most of the antiheparin problems. It acts promptly. And, since it is not prematurely eliminated, there is no heparin rebound. Though not totally free of side effects, Polybrene does not cause significant hypotension at correct dosage levels. Titration procedures are simplified as well.

Polybrene, a synthetic quaternary ammonium salt, is not hemostatic in the ordinary sense; it has no coagulant effect on unheparinized blood. It acts only as an "anti-anticoagulant"—to restore the clotting mechanism of heparinized blood.

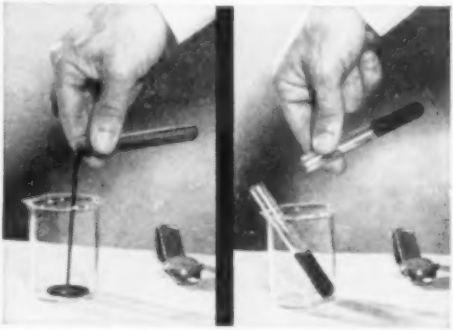
It has recently been evaluated for heart surgery in a published paper,[1] in which the authors state that since Polybrene has become available to them, its use has completely replaced their former procedure, "as we concur in the opinion that it is a superior drug for heparin neutralization."

Uses of the new agent will not be confined, of course, to

*1. Before extracorporeal procedures can begin, coagulation of blood must be prevented. Anesthesiologist injects Panheprin (Heparin, Abbott) through Venotube Twin-Site. Suspended Pliapak blood bag is also heparinized.*

*2. Open heart operation procedes. Patient's blood bypasses heart into apparatus for oxygenation. It is de-bubbled in helix (background), and then pumped through Abbott double filter (left) back to patient.*

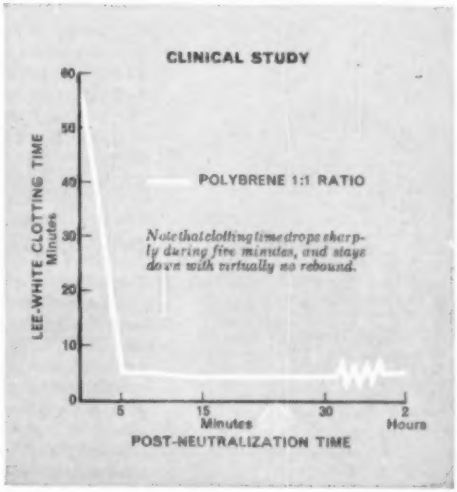
*3. Polybrene is diluted before use, to 1 mg. per ml. It is given at operation's end, slowly over 10 to 15 minutes, to neutralize heparin. Recommended ratio of Polybrene to heparin is one to one. Dose may be repeated if necessary.*



*4. LEFT: In Lee-White test, patient's heparinized blood is still liquid after normal clotting time has elapsed. RIGHT: Patient's blood, with heparin neutralized by Polybrene, shows normal clotting time restored.*

# makes extracorporeal circulation safer

cardiac surgery. Extracorporeal circulation is entering other areas. In treating cancer, for example, isolated perfusion techniques are well established; they permit drugs too toxic for systemic use, to be circulated to local parts of the body. Here, and wherever heparin requires neutralization, this new Abbott product should prove useful.

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Physiology of hearing and modern audiometry are closely correlated with the newer advances in otologic surgery. Most texts published prior to 1957 do not have this material. Modern testing procedures and such audiologic phenomena as diplacusis, recruitment and reduced discrimination ability are fully discussed. The often overlooked diseases of the tympanic membrane are also included.

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Written with a realistic new approach to the problems which confront the medical student facing for the first time the many challenging and bewildering clinical problems of a practicing physician, the new Mosby text PHYSICAL DIAGNOSIS acquaints the student with the most important basic tools of his trade—the history, physical examination and essential medical terminology. This book helps you fulfill the fundamental objective of a course in "Physical Diagnosis"—to teach the student how to obtain a good history and to perform a satisfactory physical examination. Furthermore, it is the only textbook which devotes particular attention to the student's approach to his patient, profusely illustrates the techniques of the physical examination, reduces the use of eponyms, but at the same time helps the student learn new clinical terms and provides a detailed review of body systems.

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Edited by H. F. MOSELEY, M.A., D.M., M.Ch. (Oxon), F.A.C.S., F.R.C.S. (Eng.), Assistant Professor of Surgery, McGill University; Associate Surgeon, Royal Victoria Hospital, Montreal, Canada. Written by 40 Eminent Contributors. Just Published. 1959, 3rd edition, 1336 pages, 6⅞" × 10", 738 text illustrations, 108 color plates. Price, $17.00.

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By J. ROBERT WILLSON, M.D., Professor and Head of the Department of Obstetrics and Gynecology; CLAYTON T. BEECHAM, M.D., Clinical Professor of Obstetrics and Gynecology; ISADOR FORMAN, M.D., Clinical Professor of Obstetrics and Gynecology; and ELSIE REID CARRINGTON, M.D., Assistant Professor of Obstetrics and Gynecology, all at Temple University School of Medicine and Temple University Medical Center. New. 1958, 605 pages, 6¾" × 9¾", 267 illustrations. Price, $10.75.

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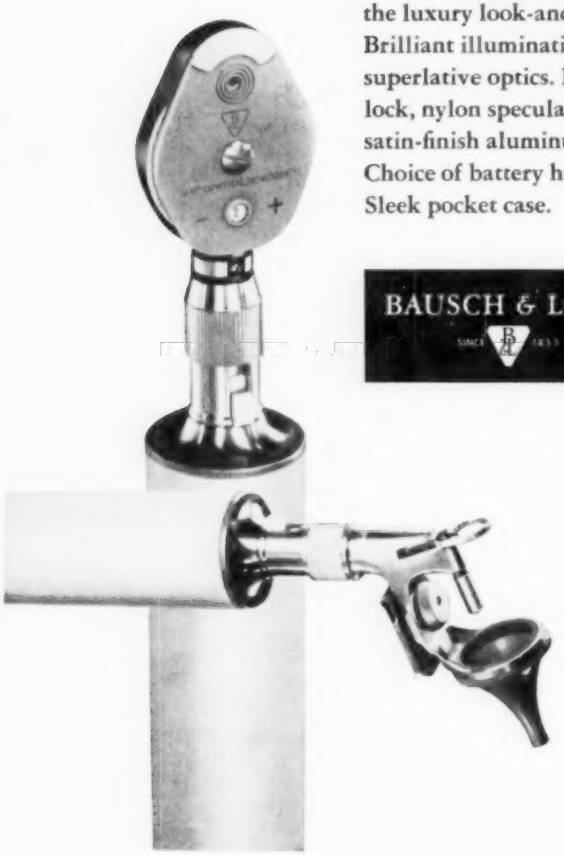

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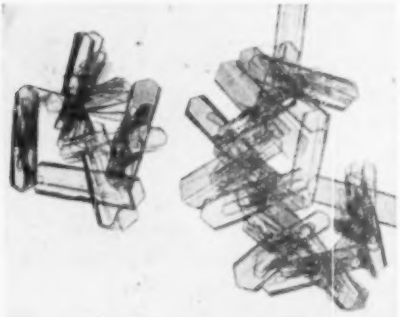

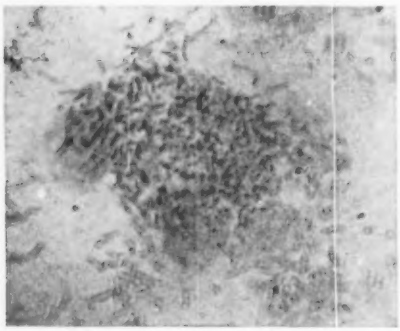

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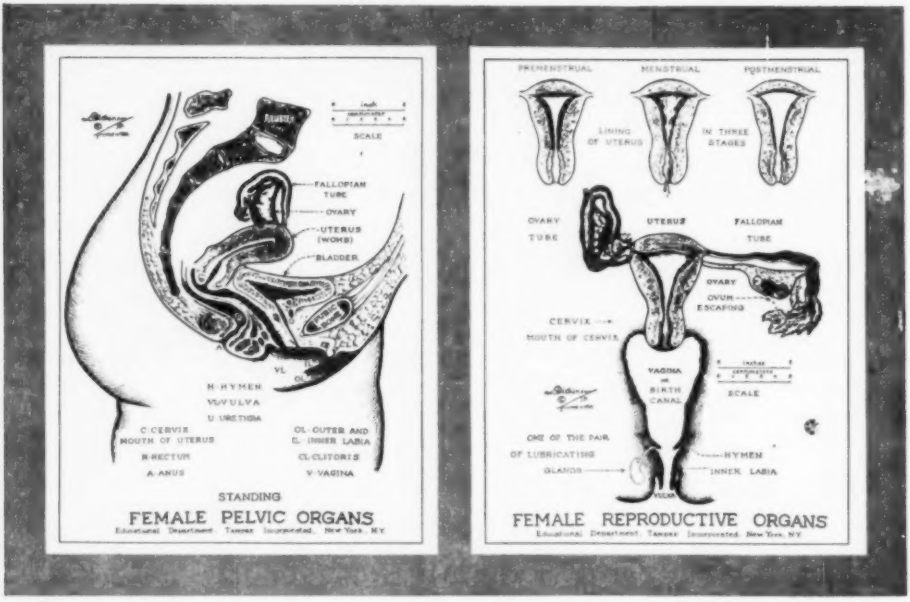


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# NEWS FROM THE MEDICAL SCHOOLS

### Boston

Dr. CHESTER S. KEEFER, director and dean of the Boston University School of Medicine since 1955, has been appointed director of the newly created Boston University–Massachusetts Memorial Hospitals Medical Center. Dr. Keefer has resigned as dean and chairman of the department of medicine to accept this new position. Before joining the Boston medical school faculty in 1940, he taught at Johns Hopkins University and Hospital, the University of Chicago, Peiping Union Medical College in China and the Harvard Medical School. Dr. LAMAR SOUTTER, associate dean and professor of surgery, has been named acting dean of the school.

Dedication ceremonies for the newly completed Industrial Rehabilitation Unit of the Boston University–Massachusetts Memorial Hospitals Medical Center were held October 1. The new Unit, headed by Dr. HENRY J. BAKST, professor and chairman of the department of preventive medicine at Boston University's school of medicine, serves as a training facility for physicians, nurses, social workers, physical therapists and medical students and provides care for patients with severe handicaps.

### Bowman Gray

In observance of the 20th anniversary of the founding of the Bowman Gray School of Medicine of Wake Forest College, the school's new $2 million addition was dedicated Oct. 23. Known as the James A. Gray Memorial Building, the five-story structure more than doubles space previously available to the school since its completion in 1941. The opportunity to transform the two-year school, founded in 1902, into a four-year school was afforded by a bequest from the late Bowman Gray. The first doctors of medicine were graduated from the new school in 1943, and since that time, Bowman Gray School of Medicine has trained and educated nearly 800 physicians—an increase of more than 50 per cent over the number which received only two years of medical training in the 39 years prior to the opening of the four-year school.

### Chicago Medical

A graduate training program in psychiatry has been initiated by the Chicago Medical School for residents and for general practitioners interested in becoming psychiatrists. Dr. HARRY H. GARNER, head of the department of psychiatry and neurology, will direct the program. Dr. MELVIN GRAY will be education and training director.

### Cincinnati

The new William B. Wherry Medical Research Building opened formally in ceremonies held Sept. 21. The $1.75 million structure houses research and graduate training for the basic sciences of biological chemistry, microbiology, physiology, pharmacology, and preventive medicine. Named in honor of the late Dr. Wherry, who was head of the department of bacteriology and hygiene for many years, the new building is now headquarters for much of the university's more than $2 million yearly medical research.

### Hahnemann

Dr. HENRY T. NICHOLS has been named professor and head of the department of

thoracic surgery. He has been acting head of the department since September, 1958.

**Illinois**

A University of Illinois psychiatrist has been appointed director of mental health for the City of Chicago. Dr. HAROLD M. VISOTSKY, assistant professor of psychiatry, will head up the program of the mental health section of the Chicago Board of Health under the direction of Dr. Herman N. Bundesen, president. Dr. Visotsky, who took over his new duties Sept. 1, will retain his faculty status at the college of medicine. Working with a staff of three part-time psychiatrists, two full-time psychologists, and seven social workers, the University of Illinois psychiatrist is the first full-time director appointed to the position.

The university's board of trustees has approved a new clinical program that has been five years in the making. Formulated by the college's Committee on Instruction, the program is seen as a means of providing students with an opportunity to observe the course of patients' illnesses over longer periods of time, increasing the clinical orientation of students prior to arrival on the clerkships, providing for some patient-centered experience in preventive medicine and public health and in radiology, and allowing for an interdisciplinary approach to the teaching of medicine. According to university sources, highlight of the program is the addition of a fourth quarter in the senior year which, for the first time, will free senior students to pursue a variety of special interests or, if qualified, to take advanced study in the Graduate College.

**Kansas**

A former member of the faculty returned to the Medical Center September 1, as head of the section of anesthesiology and professor of surgery. Dr. EVAN L. FREDERICKSON returns to Kansas from the University of Washington, Seattle, where he was associate professor of pharmacology and anesthesiology. Dr. Frederickson served on the faculty from 1953 to 1955 as assistant professor of anesthesiology.

**New York University**

Dr. GEORGE Y. SHINOWARA has been named professor of pathology at the college of medicine and has assumed direction of a new laboratory which was set up in the NYU-Bellevue Medical Center to carry on his research in the study of blood, tissue proteins and coagulation components. Dr. Shinowara comes to NYU from Ohio State University where he served on the faculty for 21 years.

**Oklahoma**

Dr. MARTIN M. CUMMINGS, director of medical research for the Veterans Administration in Washington, D.C., has been appointed professor and chairman of the department of microbiology. With the Veterans Administration since 1949, Dr. Cummings has headed the research service in the VA's department of medicine and surgery since 1953. He will continue to be affiliated with the VA as a consultant to the agency's Oklahoma City hospital.

**Oregon**

Construction for the new $2.5 million medical research laboratories building has tentatively been scheduled to begin in the spring of 1960. The nine-story building will contain space for research and in addition to laboratories, will house a radioisotope center, equipment rooms, animal quarters, and scientific instrument shops.

**Pennsylvania**

The Pharmaceutical Manufacturers Association has awarded a grant of $21,000 to the school of medicine for a program of training for research and teaching in clinical pharmacology. With supplementary funds, the PMA grant will make possible the expansion of a long range interdisciplinary program to help fill a gap in the basic and clinical medical sciences. According to Dr. C. J. LAMBERTSEN, professor of pharmacology and responsible for the training program, the grant offers an opportunity for improve-

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ment of the interdisciplinary program, first by providing support for two Fellows in Clinical Pharmacology and second, by aiding in the development of a distinct program of training in the field of clinical pharmacology. Dr. S. CRAIGHEAD ALEXANDER and Dr. ROBERT LUCHI have been named first Pharmaceutical Manufacturers Association Fellows in Clinical Pharmacology for 1959–60.

**Pittsburgh**

Dr. CECIL G. SHEPS, hospital administrator from Boston, will join the faculty of the Graduate School of Public Health in early 1960. In his new position, Dr. Sheps will head up a program of research, field service, and advanced education in the broad field of the organization and administration of medical care and hospital service. Dr. JOHN R. MCGIBONY, who formerly headed the program, recently accepted a post as consultant to the Indian Ministry of Health for the U.S. State Department. Dr. Sheps is currently director of Beth Israel Hospital, Boston, and clinical professor of preventive medicine at Harvard Medical School.

**Saint Louis**

A 60-bed, $1 million Health Institute for the treatment and study of mental illness is the first step toward the university's 150th Anniversary Development Program. Made possible by a gift of $500,000 from David P. Wohl and a matching grant under the Hill-Burton program, construction of the clinic is scheduled to begin early next year. According to university officials, the new facilities will provide additional patient care and support a program of education for professional personnel in the field of mental health. The building is essentially a university hospital with facilities for in-patient and out-patient service, teaching and research. In addition, space has been provided for occupational and recreational therapy, offices, a classroom, and library facilities.

**SUNY-Brooklyn**

The department of neurosurgery, a separate department since 1952, merged recently with the department of surgery, thus returning to its former status as a division of the department of surgery. Headed by Dr. CLARENCE DENNIS, professor and chairman, the department of surgery will now include five separate divisions in addition to general surgery: neurosurgery; ophthalmology; orthopedic surgery; otorhinolaryngology; and urology. The division will be under the direction of Dr. ALBERT COOK, assistant professor of neurosurgery.

**Stritch**

Dr. HERBERT E. LANDES, who headed the department of urology, died September 23. Dr. Landes also was chief of the department of urology at Mercy Hospital, and consulting urologist at the Municipal Tuberculosis Sanitarium, Chicago.

**University of Washington**

The appointment of two physicians, both associated with Johns Hopkins University School of Medicine, to joint positions with King County Hospital and the University of Washington School of Medicine, has been announced. Dr. ROBERT C. PETERSDORF will become director of the medical service at King County Hospital and associate professor of medicine at the school. Dr. JAMES CANTRELL was named director of surgery at the hospital and professor of surgery at the university. Both men will serve as administrative heads of their services at the hospital and will assume responsibility for that part of the medical school's teaching program.

**Washington University**

First patients were admitted October 1, to the new $800,000 Irene Walter Johnson Institute of Rehabilitation at the Washington University–Barnes Hospital Medical Center. Formal dedication of the two-story building was held October 29. Under the di-

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rection of Dr. ERIC REISS, assistant professor of medicine, the new accommodations provide the Medical Center with expanded facilities in the field of chronic illnesses and disabilities. Activities of the Institute will be coordinated through the department of preventive medicine and public health.

### Woman's Medical College

Dr. DONALD R. COOPER has been named professor of surgery, succeeding Dr. L. KRAEER FERGUSON, who was named professor emeritus. Dr. Cooper joined the faculty in 1950 as associate in surgery and subsequently served as assistant professor and associate professor.

Dr. ROBERT L. LAMBERT has been named Medical Director of the Hospital of Woman's Medical College, succeeding Dr. EVA FERNANDEZ FOX, who will continue as a member of the faculty in the department of radiology and medicine.

### Yale

Dr. MILTON C. WINTERNITZ, who served as dean of the Yale School of Medicine from 1920 to 1935, died October 3, at the Hitchcock Clinic. He was 74 years old. A pathologist by training, Dr. Winternitz was best known for his work as a medical educator and administrator first and chiefly at Yale, and later for various governmental and private agencies.

### British Columbia

Dr. BRUCE D. GRAHAM, former professor of pediatrics at the University of Michigan Medical School, will head the department of pediatrics at the University of British Columbia. He will assume his new position in November. Dr. Graham has been on the Michigan faculty since receiving his M.D. degree from Vanderbilt University in 1942.

# ITEMS OF CURRENT INTEREST

### T. Duckett Jones Memorial Award Goes to Dr. Karl Meyer

In recognition of his pioneer and continuing work in the field of mucopolysaccharides, Dr. Karl Meyer, Columbia University College of Physicians and Surgeons, is the recipient of the second annual T. Duckett Jones Memorial Award. This award is in the amount of $6500 and is one of the larger awards in American medicine.

Created in 1954 shortly after Dr. Jones' death, the fund was established with the many financial contributions made by the world's medical scientists and teachers who wished to honor his memory and perpetuate his ideals. The continuing contribution of such unsolicited funds caused a number of his friends to band together under a formal organization—The T. Duckett Jones Memorial Fund Committee—which actively pursued the goal of raising $100,000 in capital funds, the income from the fund to be used in such a manner as to perpetuate Dr. Jones' memory and philosophy. Subsequently The Helen Hay Whitney Foundation voted to match the annual income from this fund. At the time of his death, Dr. Jones was Medical Director of the Helen Hay Whitney Foundation.

### Merck Company Establishes Fund

A $400,000 George W. Merck Memorial Loan Fund has been established by The Merck Company Foundation to help meet an important need for financial aid to interns and residents, according to Henry W. Johnstone, Foundation president. The fund will assist deserving interns and residents in seeking the best possible postgraduate training in teaching hospitals before entering practice. It is estimated that 60 to 100 young doctors will benefit each year from the fund.

Administration of the fund will be made by the deans of the medical schools, who will have complete freedom in the selection of recipients, the amount of each loan, and the terms of its repayment. The Merck Company Foundation will allocate the $400,000 over a period of eight years, by which time the Memorial Fund is expected to become self-sustaining.

### Veterans Administration Appoints Director of Medical Research

Dr. MARC J. MUSSER, director of professional services at the Veterans Administration Hospital, Houston, Texas, and professor of medicine at Baylor University College of Medicine, was named director of medical research for the VA. In his new position in Washington, D.C., Dr. Musser will coordinate a nationwide program of some 6,000 individual and cooperative studies, with major categories in cancer, heart and blood vessel disease, mental illness, aging, tuberculosis, atomic medicine, and dental research.

### Pan American Medical Association Makes New Appointment

Dr. JOSE GONZALEZ, Director of the Latin American Program of the American Hospital Association and Executive Secretary of the Inter-American Hospital Association, has been named President of the Section on Hospital Administration of the Pan American Medical Association. Dr. Gonzalez received his Doctor of Medicine degree from the National University of Mexico and served his internship at the University Hospital at Mexico City. He served a rotating internship and residency in urology at Charity Hospital of Louisiana before attending Northwestern University, where he received a Master's degree in Hospital Administration in 1946. Dr. Gonzalez was placed in charge of the Latin American program of the American Hospital Association under contract with the United States International Cooperation Administration when the program was organized in 1954. He has continued in that position under a grant from the W. K. Kellogg Foundation begun last year.

The forthcoming Congress will mark the first time a full scale hospital administration program has been included among the 48 Sections of Medicine and Surgery which make up the Association's program.

# PERSONNEL EXCHANGE

## Faculty Vacancies

IMMUNOCHEMIST OR BIOCHEMIST: Must be interested in field of infectious diseases. Activities include studies on immune mechanisms and on the biochemistry of virus infections. Full-time research position. Salary open; minimal $8,000. Apply H. A. Wenner, M.D., Section for Virus Research, University of Kansas School of Medicine, Kansas City, Kansas.

PSYCHIATRISTS: Newly organized department of psychiatry in east coast medical school needs full-time psychiatrists for research and teaching. Rank and salary are dependent on experience and qualifications. Address: V-77.

DIRECTOR OF MEDICAL EDUCATION: for new 350-bed hospital. New position. Internal medicine specialist preferred for full-time position. Beginning salary about $15,000 per year. Address inquiries to: Sister Administrator, Providence Hospital, Washington 17, D.C.

PHARMACOLOGIST: The University of Alberta invites applications for the position of Associate Professor of Pharmacology, effective not later than September 1, 1959, at a minimum salary of $8,000 per annum, with annual increments. Duties include undergraduate and graduate teaching and a program of research. Applicants possessing a medical degree, in addition to qualifications in pharmacology, will be given preference. Applications should include a recent photograph or snapshot, a curriculum vitae, and the names of three references, and should be sent to the Dean of Medicine, University of Alberta, Edmonton, Alberta, Canada.

ASSISTANT IN PSYCHIATRY: Research assistant wanted for psychosomatic project from July 1, 1959. Associated university affiliation. Salary according to qualifications up to $5,700. Apply to Professor R. B. Sloane, Department of Psychiatry, Queen's University, Kingston, Ontario, Canada.

ENDOCRINOLOGIST-BIOCHEMIST: M.D. to become director of biochemistry laboratory at a 400-bed general hospital with medical school faculty appointment. Duties to include teaching; research will be encouraged. Large Eastern city. Address: V-79.

PHYSIOLOGIST: Full time appointment in physiology department of large medical school. M.D. or Ph.D. with training and research interests in cardiovascular physiology. Rank and salary (Instructor to Associate Professor, starting $6400 to $9000 plus, respectively) based on qualification and experience. Insurance, pension, travel allowance, relocation, other benefits. To assume post September 1. Address: V-80.

ANESTHESIA RESIDENCIES: Announcing four appointments for residency in anesthesiology in approved department of anesthesia, University Hospitals of Cleveland, Ohio, beginning January 1, 1960, for graduates of approved medical schools or ECFMG-qualified applicants. Additional appointments for July, 1960. Stipend and other information may be obtained by writing Robert A. Hingson, M.D., Director of Anesthesia, University Hospitals of Cleveland and Professor of Anesthesia, Western Reserve University School of Medicine, 2065 Adelbert Road, Cleveland 6, Ohio.

PHARMACOLOGIST: Ph.D. Position available in a medical research institution devoted entirely to research work. Current problems deal with hematopoietic mechanism and arteriosclerosis. No immediate teaching, but possibility in the future if interested. Write to: Director, Toledo Hospital Institute of Medical Research, 2805 Oatis Avenue, Toledo 6, Ohio.

BIOCHEMIST: Ph.D. Trained in protein chemistry, for research institute work on isolation of regulators concerned with the mechanism of hematopoiesis. Address inquiries to: Director, Toledo Hospital Institute of Medical Research, 2805 Oatis Avenue, Toledo 6, Ohio.

PSYCHIATRIST: Board certified or Board eligible, to act as a consultant to state mental health clinics, plan education programs for clinic personnel, to assist communities in organizing mental health clinics, to teach medical students and psychiatric residents concerning the field of community mental health, and to organize and participate in research on problems in community mental health. Interest in child psychiatry desirable. Position carries a professorial appointment in the medical school. Rank and salary according to qualifications. Address: Paul E. Huston, M.D., Chairman, Department of Psychiatry, College of Medicine, State University of Iowa, Iowa City, Iowa.

PEDIATRICIAN: Full-time teaching and research. Interested candidates please send complete curriculum vitae and recent photograph to Dr. J. M. Severens, Creighton University School of Medicine, Omaha 2, Nebr.

ASSISTANT PROFESSOR OF ANATOMY: Ph.D. or M.D. State medical school, Southwest. Opening for histologist-embryologist with research interests. Ample time and facilities for investigative work. Salary dependent on past record. Address: V-81.

PSYCHIATRIC SOCIAL WORKER: Full time appointment as assistant professor of psychiatric social work in department of psychiatry. Duties will include some administrative responsibility, supervision and teaching in the undergraduate program of the medical school and in the residency training program. Salary, $7500 per annum. Interested applicants should send curriculum vitae and a recent photograph to Mrs. Imogene S. Young, Director, Psychiatric Social Work Services, University of Maryland Medical School, Baltimore 1, Maryland.

DIRECTOR OF INTERN EDUCATION: Physician director of Intern Education needed for 300-bed hospital. Salary $10,000 per annum, plus extra stipend for research fellowship. Write Dalton M. Welty, M.D., Washington County Hospital, Hagerstown, Md.

VIROLOGIST: Positions available for two individuals with B.S. or M.S. degrees with background in virology. Positions are in a research laboratory associated with a medical school. Address: V-82.

**To aid in solution of the problem of faculty vacancies, MEDICAL EDUCATION will list persons and positions available, as a free service. The school department or person may have the option of being identified in these columns or of being assigned a key number for each position listed. Mail addressed to key numbers will be forwarded to the person or department listing the request.**

**Information for these columns should reach the Personnel Exchange, Journal of Medical Education, 2530 Ridge Avenue, Evanston, Illinois, not later than the 10th of the month which precedes the month in which the listings will appear.**

## Personnel Available

BIOCHEMIST: Ph.D., age 30. Assistant professor of biochemistry desires academic position. Five years medical and graduate teaching experience. Membership in national societies, honors, grants, graduate students. Fifteen full-length publications. Research interests: enzymology, microbial metabolism and protein metabolism. Available July 1, 1959. Address: A-394.

PHYSIOLOGIST-PHARMACOLOGIST: Ph.D., 1954. Male, married, with family. Presently teaching physiology in dental school. Desires teaching position with research opportunities in physiology or pharmacology department. Address: A-395.

PATHOLOGIST-BACTERIOLOGIST: M.S., B.S. (London University); M.R.C.S. (England) L.R.C.P. (London). Age 42, family; registered with British General Medical Council. Five years experience in general and clinical pathology and bacteriology, London, England. Completing 3-year contract in Jamaica. Desires academic appointment in U.S., preferably in the South. Available May, 1959. Address: A-397.

VIROLOGIST-PATHOLOGIST: Excellent experience and background in infectious diseases, human and animal viruses. Broad interests include cancer and pathogenesis. D.V.M.-Ph.D., age 34. Presently in industry. Desires research and teaching position. Would consider Senior Fellowship. Address: A-398.

INTERNIST-HEMATOLOGIST: Age 36, Board certified, with five years academic-type practice and previous research experience, seeks academic position in moderate sized city. Address: A-399.

PSYCHIATRIST: Female, age 26, completing final year of residency in June 1959. Training includes two years in an active university program and participation in family studies in schizophrenia. Analytically (Sullivanian) oriented. Special interests: Psychotherapy with schizophrenics, teaching professionals and non-professionals, liberal arts. Seeks position teaching in medical school with time for limited private practice. Interested in small university community. Address: A-400.

PHARMACOLOGIST: Ph.D., 1955; married, 3 children. Presently teaching pharmacology to medical students. Publications. Research interests: drug metabolism and toxicology. Desires teaching appointment in medical school that would provide opportunity for completion of courses leading to M.D. degree. Would continue teaching pharmacology after receiving the degree. Available August 1. Address: A-401.

INTERNIST: M.D. Age 33. Currently on faculty of eastern medical school. Experience in private practice and industrial medicine. Eight months experience and training in psychiatry. Desires faculty appointment with opportunity for clinical investigation in cardio-vascular diseases, as well as teaching general medicine, in teaching hospital. Address: A-402.

VETERINARIAN: Experienced in microbiological techniques; presently at a medical school. Desires position as director of experimental animal laboratory. Address: A-404.

MICROBIOLOGIST-VIROLOGIST: Ph.D., presently on university faculty. Five years experience in virology and tissue culture publications. Desires academic position involving full-time research or research and teaching. Address: A-405.

ORTHOPAEDIC SURGEON: 38. Wants appointment in U.S.A. or Canada. Main interest in Traumatic Surgery and Research. Now holding consultant post at well known British Hospital. Mastership in Surgery and Fellow of the Royal College of Surgeons. Address: A-406.

PSYCHIATRIST-NEUROPHYSIOLOGIST: M.D. Certified in psychiatry and as a mental hospital administrator. FAPA and FSPA. No formal training in neurophysiology but using some of its principles with gratifying results in coping with the manifold problems of psychosomatic medicine. Desires full-time career teaching position in medical school with opportunities for teaching psychiatry; for learning clinical neurophysiology well enough to instruct; and for carrying on more intensive course of clinical investigation. Address: A-407.

PHYSIOLOGIST: Ph.D., 1957, age 31, married, one child. Research in cardiovascular-renal physiology. Strong background in hypertension. Eleven publications. Experience in teaching medical, dental, and pharmacy students. Desires research position with or without teaching responsibilities. Address: A-408.

MICROBIOLOGIST: Ph.D., Sept., 1959. Training in all fields of basic microbiology with research in microbial metabolism. Desires faculty position with teaching and research opportunities in a university or medical school. Address: A-409.

PHYSIOLOGIST-ENDOCRINOLOGIST: Ph.D., age 36. Training and background in endocrine, cellular, mammalian and zoological physiology. Presently assistant professor engaged in teaching and research in endocrinology and general physiology. Formerly research associate in biochemistry. Desires academic and/or research position. Address: A-410.

ANATOMIST: Age 34, married. Ph.D. Anatomy 1957. Publications. Teaching experience in Eastern medical school. Desires teaching position with opportunity for research. Address: A-411.

INTERNIST: Age 35, married. Ten years training in internal medicine and hematology. Teaching experience and research in field of clinical hematology, $B_{12}$ metabolism, radioactive uptakes, experimental hematology, and enzyme studies. Desires teaching position with opportunity for research. Address: A-412.

SURGEON: Age 35, native of Bombay, India. In U.S. since 1952. F.C.P.S. (Bombay). F.R.C.S.E. (Edinburgh). Completed residency training in general surgery in U.S. and successfully taken Part I examination of American Board of Surgery. Desires full-time position in teaching and/or research in American medical school. Presently senior resident in surgery in Eastern hospital. Experience in plastic surgery as well as urology and anesthesiology. Address: A-413.

UROLOGIST: University trained, finished 1956. Seeking full-time academic post: teaching, research, and clinical work. Presently in private practice and part-time university teaching. Address: A-414.

GROSS ANATOMIST: D.S.D., Ph.D. Ten years teaching experience in medical school; previously taught in dental school. Clinical experience in plastic and oral surgery. Research interests and publications: homotransplantation of tissues. Desires academic position in medical or dental school with research facilities. Will consider research associateship with plastic surgery department. Address: A-415.

MICROBIOLOGIST: Ph.D. Seeking position on medical school faculty in Southeast or Southwest. Many years experience and supervision in clinical microbiology. Six years on medical school faculty. Qualified in parasitology, virology and public health. Address: A-416.

SURGEON: Age 33. Certified in surgery and thoracic surgery. University trained with research background. Presently holding part-time university teaching appointment. Desires full-time academic appointment in surgery, preferably with additional duties as assistant dean working with curriculum and postgraduate training program. Address: A-418.

INTERNIST-GASTROENTEROLOGIST: Age 42. Board certified in internal medicine and in gastroenterology. Training and experience include 4 years as Mayo Foundation Fellow, full-time instructor in gastroenterology in leading university, clinical investigation and private practice. Trained in all gastroenterological techniques and bone marrow interpretation. Qualified in hematology, peripheral vascular diseases and rheumatology. Desires academic position in internal medicine, gastroenterology, comprehensive medical care section, as Assistant Dean, or as Director of Medical Education in teaching hospital. Address: A-419.

MICROBIOLOGIST-CLINICAL PATHOLOGIST: M.D., Ph.D., age 54, married. Wide experience in teaching and research in the United States. Returning after several years of teaching in medical schools in the Far and Middle East. Textbook in course of publication. Desires research or teaching position in medical school or in teaching hospital. Address: A-420.

PATHOLOGIST-VIROLOGIST: DVM, Ph.D. Experience in comparative pathology, virology and tissue culture techniques. Also considerable experience in teaching experimental pathology to medical students. Desires teaching appointment in a medical school that would provide opportunity for completion of courses leading to M.D. degree. Address: A-421.

PSYCHIATRIST: Board certified, with training in both general clinical psychiatry and public health psychiatry (M.P.H. degree). Six years' experience in administering a community-oriented psychiatric training program in an academic setting. Broad range of personal service in teaching, supervisory, and consultative capacities. Dynamic orientation. Numerous research publications. Age under 40. Currently assistant professor at medical school. Desires full-time faculty appointment at higher level. Address: A-422.

PSYCHIATRIST: Board certified in psychiatry and child psychiatry (pending). Eight years experience in teaching at student and research level in adult and child psychiatry in academic setting. Broadly experienced in teaching, supervisory, and consultative capacities. Analytic orientation. Nine publications. Experience in administering child guidance clinic and in community aspects of psychiatry. Has held position as associate professor of psychiatry; wishes to head up division of child psychiatry in medical school in either true or geographic full-time position. Metropolitan area preferred. Age 45; married; 4 children. Address: A-423.

PHYSIOLOGIST-PHARMACOLOGIST: M.D., Ph.D., age 40. Teaching and research experience includes six years in pharmacology and six years in physiology, with one year training in laboratory of high polymer chemistry. Desires academic and research position in physiology or pharmacology department. Address: A-424.

INTERNIST: Board certified, university trained, with one year training in clinical cardiology and one year in cardiovascular laboratory. Presently holding position as university instructor. Desires faculty appointment with teaching and research in clinical cardiology and electrocardiography. Address: A-425.

ANATOMIST: Ten years teaching experience; all phases of medical school anatomy. Broad research interests with grant support in gross anatomy and histology. Desires university appointment. Northeast or northwest preferred. Address: A-426.

# INDEX TO ADVERTISERS

# PUBLICATIONS

Useful information for both medical educators and students is published by the Association of American Medical Colleges. These publications may be obtained from the Association headquarters office, 2530 Ridge Avenue, Evanston, Ill.

**Books and Pamphlets**

Admission Requirements of American Medical Colleges—1958–59 ($2.00).

History of the Association of American Medical Colleges—1876–1956

The National Health Service of Great Britain ($1.00).

El Estudiante de Medicina ($1.00)

Suggestions for Supplementing the Medical Curriculum in Time of National Emergency

A Study of Medical College Costs ($1.50)

**The Journal of MEDICAL EDUCATION**

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Journal supplements available:
- Education of Physicians for Industry ($2.00).
- Support of Research by American Cancer Society ($1.00).
- Survey of Women Physicians graduating from Medical School 1925–40 ($1.00).
- Medical Education for Foreign Scholars in the Medical Sciences ($1.50).

**Teaching Institute Reports** ($2.00 paperbound, $3.00 clothbound).

Report of the Conference on Preventive Medicine in Medical Schools (Report of the 1952 Institute).

The Teaching of Physiology, Biochemistry and Pharmacology (Report of the 1953 Institute).

The Teaching of Pathology, Microbiology, Immunology and Genetics (Report of the 1954 Institute).

The Teaching of Anatomy and Anthropology in Medical Education (Report of the 1955 Teaching Institute).

The Appraisal of Applicants to Medical School (Report of the 1956 Institute).

The Ecology of the Medical Student (Report of the 1957 Institute).

Report of the First Institute on Clinical Teaching (Report of the 1958 Institute).

**Medical Audio-Visual Institute Publications**

Film Catalog, Fall 1955 and Supplements.

Films in Psychiatry, Psychology and Mental Health (available from the Health Education Council, 92 Belmont Drive, Livingston, N.J.).

Films in the Cardiovascular Diseases (Part I available from the American Heart Assn.), 44 E. 23rd St., New York 10, N.Y. ($2.00).
Part II available from the Medical A-V Institute ($2.00).

**Publications of Related Organizations**

Hospitals Participating in the Matching Program 1959 (NIMP).

Results of the Matching Program 1959 (NIMP publication).

The Student and the Matching Program 1959 (NIMP publication).

Medical College Admission Test—Bulletin of Information 1959 (Educational Testing Service publication).

Psychiatry in Medical Education—1951 Conference ($1.00).

The Psychiatrist: His Teaching and Development—1952 Conference ($2.50).

(The above can be obtained from: American Psychiatric Assn., 1785 Massachusetts Avenue, NW, Washington, D.C.).

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